

	INVITATION FOR BIDS (IFB) FOR EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT BPCL MUMBAI REFINERY. TENDER REF. NO.: 1000440719 (E-TENDER SYSTEM ID: 22004) DATED 13-08-2025

GLOBAL COMPETITIVE BIDDING (OPEN TENDER)

1.1 INTRODUCTION:

- 1.1.1 Bharat Mumbai Refinery (MR) has crude processing capacity of 12.0 Million Metric Tonnes per Annum (MMTPA). The refining capacity has been augmented to the present level through progressive revamps, addition of various process units and incorporation of advanced refining technologies.
- 1.1.2 BPCL intends to set up a PRFCC unit to maximize propylene and transport fuel & minimize bottoms from MR.
- 1.1.3 BPCL intends to secure services of experienced Consultant for “EPCM services for Petro Resid Fluidized Catalytic Cracking (PRFCC) unit and its associated facilities at BPCL Mumbai Refinery.”
- 1.1.4 E-Bids under Single Stage Two Part Bid System comprising of Pre-Qualification Bid + Techno-Commercial bid (Unpriced bid) and Priced bid are invited from competent bidder for providing aforesaid services.

1.2 BRIEF SCOPE OF WORK:

- 1.2.1 It is proposed to seek the services of an experienced consultant for providing Engineering Procurement and Construction Management (EPCM) for Petro Resid Fluidized Catalytic Cracking (PRFCC) unit and its associated facilities at BPCL Mumbai Refinery”.

The proposed project consists of the following major facilities:

- Petro Resid Fluidized Catalytic Cracking (PRFCC) of 3.0 MMTPA licensed by M/s. UOP LLC, USA.
- C3/ C4 Splitter of Propylene Recovery Unit (PRU Part) licensed by M/s. UOP LLC, USA. » Amine Regeneration Unit (ARU) to process ~8500 MT/D Rich MDEA.
- Caustic Merox and Purge treatment unit (PTU): The Unsaturated LPG Treating Unit removes Sulphur compounds (Mercaptans, H₂S and COs) from amine washed LPG received from PRFCC.
- Sour Water Stripper (SWS-4): Revamp required to accommodate additional sour water from PRFCCU.

- Associated Utilities and Offsites including standalone and augmenting the existing facilities.

The Project consists of licensed process units, Open Art units along with utilities, offsites and other infrastructure facilities.

1.2.2 The broad scope of work of EPCM consultant is as follows:

ENGINEERING, PROCUREMENT & CONSTRUCTION MANAGEMENT (EPCM) services for PRFCCU and its associated facilities Project at MR- Overall project management, Developing project procedures and project management plan, activities as listed in technical scope, Review, Updation, preparation and finalization of Basic Design Engineering Package (BDEP) / Process Package/ Design Basis submitted by Process Licensor(s) / PMC, Review, Updation, Preparation and Finalization of BDEP/ Front-End Engineering Design (FEED) for all Licensed & Open Art units, Review, Updation, preparation and finalization of Basic Design Engineering Package for OSBL (Offsite & Utilities), Detailed and Residual engineering for PRFCCU / ARU / SWS / PRU(Part), PTU, Caustic Merox and Utilities & Offsite facilities, Tendering & Award of work packages/Conventional items and other work/contract packages, Tendering and award of long lead items (LLI's), other equipment & items, Preparation of tender documents, Tendering and award of contracts, Review of detailed engineering documents by vendors/contractors, IBR package preparation/ Coordination with GBI for obtaining IBR certification, assistance for Statutory Approvals / Clearances, Procurement & Contract Services Assistance, Project Monitoring, Inspection & Expediting, Quality management, Assistance for Transportation of Over Dimensional Consignments including route survey, Material Control & Warehouse Management, Construction management & supervision including Quality Assurance, Mechanical Completion, assistance in start-up, Pre-commissioning, Commissioning & Performance Guarantee Test Run (PGTR) activities and project closure activities including final bill/invoice for the project at Mumbai refinery of Bharat Petroleum Corporation Limited, India in line with the bidding documents, specifications and conditions.

2.0 SALIENT FEATURES OF BIDDING DOCUMENT:

SR. NO.	SALIENT FEATURES	:	DETAILS
a)	Bidding Document No. and date	:	TENDER REF. No.: 1000440719 DATED 13-08-2025 (E-TENDER SYSTEM ID: 22004)
b)	Bidding Document & subsequent Addendum/ Corrigendum (if any) available on Website for viewing & downloading	:	The documents can be downloaded from BPCL's e-tender portal: https://bpcltenders.eproc.in The link to bidding document is also available on Govt. of India Central Public Procurement Portal (CPPP) and BPCL corporate website.

c)	Period during which Bidding Document can be viewed & downloaded from Website	:	From 13-August-2025 to 10-September-2025 (14:00 Hours IST) Refer BPCL's e-tender portal for extensions (if any) etc.
d)	Last date of Receipt of Bidder's Queries for Pre-Bid Conference	:	22.08.2025 Queries to be forwarded to following Email ID: gawaimanoj@bharatpetroleum.in sureshk@bharatpetroleum.in naveenc@bharatpetroleum.in chandramoredp@bharatpetroleum.in
e)	Pre-Bid Conference	:	25.08.2025 14:00 Hrs. (IST) Pre-Bid meeting shall be conducted at BPCL Mumbai Refinery. For creation of Gate Passes, Bidders are requested to send the details of the participants through email to the following email ID minimum one day prior to the date of meeting. Email IDs: gawaimanoj@bharatpetroleum.in sureshk@bharatpetroleum.in naveenc@bharatpetroleum.in chandramoredp@bharatpetroleum.in In case Bidders are not able to attend the Pre-Bid meeting at Mumbai Refinery site, they can attend the same virtually on Microsoft Teams. Bidders are requested to send the details of the participants through email. The link to join the meeting is mentioned below. Microsoft Teams Join the meeting now Meeting ID: 479 294 771 930 2 Passcode: Vt26VM2M Site visit: Bidders are advised to visit and examine the site on the same date 25.08.2025 (10:00 hrs onwards), its surroundings and familiarise themselves with the existing facilities and environment, and collect all other information including applicable laws, which they may require for preparing and submitting the bid.

f)	Last Date and time of online submission of e-Bids (Unpriced & Price)	:	14:00 Hrs. (IST) on 10 September 2025 Refer BPCL's e-tender portal for extensions (if any) etc.
g)	e-Tendering Portal for online submission of e-Bids (Unpriced & Price)	:	BPCL e-tendering portal https://bpcltenders.eproc.in
h)	Online Opening of Techno Commercial Unpriced E-Bids	:	14:30 Hrs. (IST) on 10 September 2025 Extensions, if any shall be published on BPCL's e-tender portal site.
i)	Contact Persons for any query / clarification	:	<u>For Commercial Queries:</u> Mr. Manoj Gawai, Procurement Manager (CPO), PRFCC Tel. No.: 022-2553-3268 / +91 9768843886 Email: gawaimanoj@bharatpetroleum.in Alternate email for Commercial Queries: sureshk@bharatpetroleum.in <u>For Technical Queries:</u> Mr. Naveen C, Chief Manager, PRFCC Tel. No.: 022-2552-4137 / +91 9930999074 Email: naveenc@bharatpetroleum.in Alternate email for Technical Queries: chandramoredp@bharatpetroleum.in
j)	Cost of Bidding Document	:	Not Applicable
k)	Earnest Money Deposit	:	EMD Amount: - (A) For Indian Bidders: ₹ 20 lakhs. (B) For Foreign Bidders: USD 22900 or EURO 20,030. Micro Small Enterprises (as per Govt. of India MSME Act 2006 incl. Amendments) shall be exempted from EMD. EMD (in acceptable form) shall be uploaded in designated place in tender Portal. EMD issued after the Bid Due Date & time shall not be accepted and such bid(s) shall not be considered for evaluation. For details refer ITB.

l)	Online Opening of Priced Bids of Techno-Commercially Accepted Bidders	:	Date & time will be decided later after completion of techno-commercial bid evaluation and shall be updated on e-tender portal. Bidder to refer e-tender portal for updates.
m)	Time schedule	:	Refer bidding document

- 2.1 If identified dates for bid opening (both technical bid and priced bid) happens to be a declared holiday / closed day in BPCL, activity shall be conducted on the next working day at the time specified therein.
- 2.2 Bidder shall quote the prices in Indian Currency (Indian Rupees) or US Dollars (USD) or Euro only.
- 2.3 All amendments, time extension, clarifications, etc. will be uploaded in e-tender Portal. Bidders should regularly visit e-tender Portal to keep themselves updated.
- 2.4 The following documents form an integral part of this Tender:
1. Invitation for Bids (IFB)
 2. Instructions to Bidders (ITB)
 3. Annexures under Section 2A
 4. Forms under Section 2B
 5. Techno-Commercial Document
 6. Special Conditions of Contract (SCC)
 7. Price Schedules
 8. General Conditions of Contract (GCC) and other related tender attachments
 9. Project Facilities Plot Plan

3.0 **PRE-QUALIFICATION CRITERIA (PQC) / BIDDERS QUALIFICATION CRITERIA (BQC):**

Refer **Annexure-1** to IFB.

4.0 **GENERAL REQUIREMENT:**

- 4.1 The bidders should not be serving holiday listing order issued by BPCL/MOP&NG or should not be convicted of any offence under the Prevention of Corruption Act, 1988 or the Indian Penal Code or any other law for the time being in force, for causing any loss of life or property or causing a threat to public health as part of execution of a Public Procurement contract.

A declaration for the above shall be submitted by bidder. Offers not accompanied with such declaration shall make the bidders liable for rejection. Any wrong declaration in this context shall make the bidders liable for action under the holiday listing procedure.

- 4.2 Bidder shall not be under insolvency or liquidation or court receivership or other similar proceedings. Bidder shall confirm that such proceedings have NOT been initiated and pending against them and shall submit a self-certificate stating that

they are not under insolvency, liquidation, court receivership or similar proceedings. Failure to do so or if the bidder is under insolvency, liquidation, court receivership or similar proceedings, their bids shall not be considered.

- 4.3 Bidder to give a declaration regarding their existing Litigation/Arbitration, if any. However, submission of these existing Litigation / Arbitration details may not be a reason for disqualification. In case, if declaration is not submitted, the bid will be rejected as non-responsive.

In case of Litigation/Arbitration, bidder to confirm that **the current Litigation/ Arbitration, in which bidder is involved will not have any impact in work being tendered or in entering contract during the validity of offer and performing the contract till all the contractual obligations under contract are performed.**

- 4.4 Bidder shall comply with the provisions regarding Procurement from a Country sharing Land Border with India. Contractors shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the competent authority.

Bidders shall submit a certificate of compliance in the format enclosed with the tender document. This certificate shall be on the company's letter head and shall be duly signed & stamped by the authorized signatory of the bidder.

4.5 PRE-BID MEETING

- 4.5.1 Bidders or their authorized representatives are requested to attend the Pre-Bid Meeting so that their queries, if any, related to the Bidding Document and Scope of Work can be addressed during the meeting.
- 4.5.2 The bidders are requested to send queries/clarifications, if any, as per Format enclosed in the bidding document through e-mail to reach BPCL on or before the date mentioned at Cl. 2.0 above. The clarifications shall be provided during the pre- bid meeting. Bidder shall send query in editable soft copy in the format included in the Bidding document through e-mail.
- 4.5.3 Bidders are required to participate in pre-bid meeting after going through the entire Bidding document. Bidder shall submit all technical and commercial queries separately, on which they need clarification, if required, during the pre-bid meeting to avoid any post-Bid discussion/clarification on this issue.
- 4.5.4 Non-attendance of the pre-bid meeting shall not be a cause of disqualification of the Bidder.
- 4.5.5 In case any Bidder does not attend the pre-bid meeting, it shall be understood that the Bidder has a clear understanding of terms and conditions of the Bidding document and does not have any comment / deviation to the requirement of Bidding document.

4.6 SUBMISSION OF BID & IT'S VALIDITY

- 4.6.1 Bids are required to be submitted only through e-tender portal on or before the Bid submission date and time.
- 4.6.2 Bidders in their own interest are requested to upload/submit their bid well in time. In the event of failure in bidder's connectivity with e-tender Portal during the last few hours, bidder is likely to miss the deadline for bid submission. Due date extension request due to above reason may not be entertained.
- 4.6.3 Physical Bids / Offers or Bids through any other mode shall not be accepted. The

Offers submitted through e-tender portal, as above shall only be considered for evaluation and ordering.

- 4.6.4 BPCL will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders.
- 4.6.5 The bidder should ensure that the bid documents submitted should be complete and in a compatible format so that it can be downloaded and get opened. In the event, such documents could not be opened for any reason, during the bid opening, such bid shall be liable for rejection.
- 4.6.6 The time settings displayed in the said e-tender portal will be valid for all actions of request, bid submission etc. The bidders should follow this time during bid submission.
- 4.6.7 **Validity of bid** shall be for a period of Six (06) Months from the Bid Due Date / Extended Bid Due Date, whichever is later.

4.7 OTHERS

- 4.7.1 The evaluation of bids shall be on lowest landed cost basis to BPCL.
- 4.7.2 BPCL reserves the right to assess bidder's capability to execute this work by using in-house information and considering various aspects such as past performance during evaluation of bids.
- 4.7.3 BPCL will not be responsible or liable for cost incurred in preparation, submission & delivery of bids, regardless of the conduct or outcome of the bidding process.
- 4.7.4 In case any Bidder is found to be involved in cartel formation, his Bid will not be considered for evaluation / placement of order. Such Bidder will also be debarred from bidding in future.
- 4.7.5 Canvassing in any form by the Bidder or by any other agency on their behalf may lead to disqualification of their Bid.
- 4.7.6 Unsolicited clarifications to the offer and / or change in the prices during the validity period would render the bid liable for rejection.
- 4.7.7 Bids submitted on Consortium or unincorporated Joint-Venture basis shall not be accepted.
- 4.7.8 Bidders may view the Bid opening status on the e-tender Portal.
- 4.7.9 BPCL reserves the right to reject any or all the bids received or annul the bidding process at any time without assigning any reason, whatsoever.
- 4.7.10 For detailed specifications, terms and conditions and other details, refer complete Bidding Document.
- 4.7.11 Bidders should ensure submission of complete information/documentation in the first instance itself, in support of their fulfilling the qualification/eligibility criteria specified in PQC. BPCL reserves the right to complete the evaluation based on the details furnished without seeking any additional information.
- 4.7.12 The bidder shall not be allowed to submit new references or documents related to PQC, or any other credentials related to the tender other than already uploaded on the portal. Only clarifications or added information required for evaluation of submitted credentials as per the portal will be sought as per requirement by BPCL.
- 4.7.13 During evaluation and comparison of bids, the purchaser may, at his discretion, ask the bidder for clarifications on the bid. The request for clarification shall be given

asking the bidder to respond by a specified date. If the bidder does not comply or respond by the date, his tender will be liable to be rejected. No change in prices or the substance of the bid shall be sought, offered or permitted. No post bid clarification at the initiative of the bidder shall be entertained. The shortfall information / documents shall be sought only in the case of historical documents which pre-existed at the time of the tender opening, and which have not undergone change since then. As far as the submission of documents is concerned with regards to qualification criteria as mentioned in PQC, after submission of the tender, only related shortfall documents shall be asked for and considered. For example, if the bidder has submitted a work order without its completion / performance certificate, the certificate can be asked for and considered. However, no new work order shall be considered for PQC qualification.

Annexure-1 to IFB

5.0 PRE-QUALIFICATION CRITERIA (PQC):

The following is Pre-Qualification Criteria which bidder must qualify for subsequent evaluation of the subject tender:

Bidder is responsible for quoting for the complete scope of works defined in the tender and owning single point overall responsibility for execution & completion of total job.

5.1 TECHNICAL CRITERIA

5.1.1 Bidder during last 15 (Fifteen) years (ending on last day of the month immediately previous to the month in which last date of original bid submission falls) shall meet the following criteria mentioned under 5.1.1.1, 5.1.1.2 and 5.1.1.3.

5.1.1.1. The bidder shall have experience of having completed at least

One (01) similar work* having value not less than INR 278 Crores

OR

Two (02) similar works* each having value not less than INR 223 Crores

OR

Three (03) similar works* each having value not less than INR 167 Crores

Note: The above-mentioned values are basic executed contract values excluding taxes.

(*) The definition of similar work: Bidders shall have experience of successfully completed similar work as “A” or similar work as “B” or similar work as “C” or any combination of “A” or “B” or “C” mentioned below:

A) “Engineering, Procurement, Construction Management (EPCM) Consultancy Services for any Hydrocarbon Process Unit(s) with or without associated offsite/ offsite & utilities facilities in any Petroleum Refinery / Petrochemical / Hydrocarbon Plant in India/ Abroad”.

B) “Project Management Consultancy (PMC) Services for any Hydrocarbon Process Unit(s) with or without associated offsite/ offsite & utilities facilities in any Petroleum Refinery / Petrochemical / Hydrocarbon Plant in India/ Abroad”.

C) “Engineering, Procurement and Construction Contract (EPC Contract) services / Lump sum Turn Key (LSTK) Contract services for any Hydrocarbon Process Unit(s) with or without associated offsite/ offsite & utilities facilities in any Petroleum Refinery / Petrochemical / Hydrocarbon Plant in India/ Abroad.

AND

5.1.1.2. Bidder qualifying under clause 5.1.1.1 C) shall have experience of having completed at least One (01) similar work* having value not less than INR 55 Crores of “Engineering, Procurement, Construction Management (EPCM) Consultancy Services **OR** Project Management Consultancy (PMC) Services **OR** PMC EPCM combination for any

Hydrocarbon Process Unit(s) with or without associated offsite/ offsite & utilities facilities in any Petroleum Refinery / Petrochemical / Hydrocarbon Plant in India/ Abroad during the last 15 (Fifteen) Years (ending on last day of the month immediately previous to the month in which last date of original bid submission falls).

Bidder seeking qualification under 5.1.1.1 A and 5.1.1.1 B need not submit 5.1.1.2 reference.

The job mentioned in 5.1.1.1 C & 5.1.1.2 can be either as a single job or separate jobs.

AND

5.1.1.3. The Bidder shall have experience in performing PMC/EPCM/EPC services for at least one of the following New / Grassroot Hydrocarbon Process Unit(s) in any Greenfield or Brownfield project of Petroleum Refinery/ Petrochemical/Hydrocarbon Plant in India / Abroad.

- i) Fluidised Catalytic Cracker
- ii) Naphtha cracker or Gas Cracker Unit
- iii) Hydro treater / Hydrocracker
- iv) Catalytic Cracking Reformer / Aromatic Reformer
- v) Delayed Coker Units

General Conditions for Technical Criteria:

1. Exclusive experience of Utility System / Utility block, wastewater effluent treatment, offsite facilities, etc. shall not be considered as relevant experience for clause 5.1.1 above.
2. Experience of offshore facilities (excluding Refinery) shall not be considered as relevant experience for clause 5.1.1 above.
3. Works mentioned in clauses 5.1.1.1, 5.1.1.2 and 5.1.1.3 can be part of Single or multiple work orders. However, it is clarified that for clause 5.1.1.1 and 5.1.1.2 one similar work means one single work order only subject to clarifications given in para 6 below.
4. The reference hydrocarbon units mentioned in clauses 5.1.1.1, 5.1.1.2 and 5.1.1.3 should have been commissioned within the last 15 (Fifteen) years. Also, the unit should have completed at least 12(twelve) months of operation post commissioning of the unit (ending on last day of the month immediately previous to the month in which last date of original bid submission falls).
5. The reference units should be a commercial unit (pilot plant, laboratory scale plant, demonstration plant, etc. are not acceptable).

Commissioning certificate from the plant owner shall be submitted by the bidder.

For satisfactory operation for at least 12(twelve) months after commissioning any of the following documents is required to be submitted:

a. Certification for satisfactory operation for 12 (twelve) months from client.

OR

b. Certification of completion of performance guarantee & test run (PGTR) with unit completion date at least 12 (twelve) months prior to original bid submission.

6. In case two or more Purchase Order / Work Order have been awarded to the same bidder against an individual tender (i.e. considering offer for these two or more corresponding parts of the tender) with similar work as mentioned in the PQC 5.1.1.1 and 5.1.1.2 above, these two or more Purchase Order / Work Order shall be considered as one Purchase Order / Work

Order awarded to the bidder for PQC evaluation purpose. Two or more purchase orders can be combined and can be considered as single purchase order only if those two or more purchase orders are issued under the same tender.

7. Scope of Work for EPCM Consultancy shall include a) Engineering, b) Procurement / tendering assistance / services and c) Construction Management or Supervision services.
8. Scope of Work for PMC services shall include a) Engineering or Review of Engineering, b) Tendering / Award recommendation of LSTK/EPC/Package contractor / Procurement/ tendering assistance /services.
9. Scope of Work for EPC services shall include Engineering, Procurement and Construction.
10. A job executed by a bidder for its own plant/projects cannot be considered as experience for the purpose of meeting the requirement of PQC. However, jobs executed for Subsidiary / Fellow subsidiary / Holding Company will be considered as experience for the purpose of meeting PQC subject to submission of tax paid invoice(s) duly certified by Statutory Auditor / Chartered Accountant of the bidder or duly notarized towards payments of statutory tax in support of the job executed for Subsidiary / Fellow subsidiary / Holding company. Such bidders to submit these documents in addition to the documents specified in the bidding document to meet PQC.
11. In case Bidder has executed composite works which includes qualifying work(s) as stated in clauses 5.1.1.1 and 5.1.1.2 above, then value of such qualifying work(s) out of the total value of composite works shall be considered for the purpose of qualification. It is the bidder's responsibility to produce the necessary documents for proving the value of qualifying works.
Composite works shall mean work orders of similar experience PMC/ EPCM / EPC of various Process Units/ plant facilities some or whole of which may be meeting the qualifying Criteria under clause 5.1.1.1 and 5.1.1.2.
12. Bids submitted from Consortium or Joint-Venture shall not be accepted.
13. In case of work orders, the bidders are required to indicate the Service tax /GST/ any other tax amount included or excluded in the executed amount of work. The necessary documentary evidence is also to be submitted in support of their claim. The value net of taxes will be considered for evaluation.
14. If the order is in foreign currency, the same shall be converted into equivalent INR considering the conversion rate as on date of issue of work order and shall be considered for evaluation purpose, based on FBIL (Financial Benchmarks India Pvt .Ltd.) reference rate. In the absence of FBIL reference rate, RBI reference rate will be considered. In the absence of both FBIL reference rate and RBI rate, SBI TT (Telegraphic Transfer) reference rate will be considered.
15. In case where the bidder cites the reasons of Non-Disclosure Agreement (NDA) for its inability to submit necessary documents in support of meeting the experience criteria, a certificate, in original, certifying all the required information, issued by CEO / CFO of the company along with a declaration that the bidding company is not in a position to submit the required documents owing to the NDA with an endorsement by Chartered Accountant/ Statutory Auditor / Certified Public Accountant (not being an employee or a Director or not having any interest in the bidder(s) company / firm) may be accepted. Similarly, Wherever Chartered Accountant / Statutory Auditor / Certified Public Accountant (not being an employee or a Director or not having any interest in the bidder(s) company / firm) is not in

a position to endorse such CEO / CFO's certificate due to local regulations, CEO / CFO's certificate in original without endorsement may be accepted provided a reference to the local regulation restricting this endorsement is given in the CEO / CFO certificate.

16. The bidders should not be under holiday listing order issued by BPCL/MOP&NG or should not be convicted of any offence under the Prevention of Corruption Act, 1988 or the Indian Penal Code or any other law for the time being in force, for causing any loss of life or property or causing a threat to public health as part of execution of a Public Procurement contract. Further, bidder to declare that the Agency is not or has not become bankrupt, OR is not being dissolved OR has not resolved to be wound up OR no proceedings for winding up or dissolution has been instituted against the Agency. A declaration for the above shall be submitted by bidder. Any wrong declaration in this context shall make the bidders liable for action under the holiday listing procedure. Format for the same is attached as **Annexure-IV**. Offers not accompanied with such declaration shall make the bidders liable for rejection. Any wrong declaration in this context shall make the bidders liable for action under the holiday listing procedure.
17. Since BPCL is contractually bound to follow the recommendations of the Process Licensors for sharing of their Technology with any third party, Bids from only those bidders will be accepted for further evaluation whose names are not in negative list (pertaining to CONSULTANT/ Contractors) of the Technology provider/ Process Licensor of BPCL PRFCCU. Prospective Bidders are requested to confirm through an undertaking that they are not in the negative list of the Licensor.
18. Bidder to note that BPCL will be consulting with BPCL PRFCCU licensor on the acceptance of the Bidder to (by) the licensor for sharing of technical and commercial information. In case of any objection received from the licensor, BPCL reserves the right to disqualify the consultant on whom inability of the licensor to share technical and commercial information has been communicated. BPCL reserves the right to complete the evaluation based on the details furnished without seeking any additional information.
19. It may be noted that Consultant, who has offered services / worked on previous phases / prepared Detailed Feasibility Report (DFR) for BPCL Mumbai Refinery PRFCCU project and its associated facilities of BPCL Mumbai Refinery are not debarred from participating in this tender of Engineering Procurement & Construction Management (EPCM) consultant service contract.
20. Relevant documents from DFR / Licensor data (if required by the bidder and available with BPCL) of the project will be shared to bidder after signing Non- Disclosure Agreements with BPCL/Licensor by the bidder.

In case bidder does not meet the Pre-Qualification Criteria on its own, bidder can still be qualified based on the credential of its Foreign Holding Company / Subsidiary company / other Subsidiary of Holding Company, who meets the Pre-Qualification Criteria.

Additional Note/ conditions in case the bidder is a foreign bidder or the bidder intends to meet the PQC based on credential of its Foreign Holding Company / Subsidiary company / other Subsidiary of Holding Company:

- (i) In case where Indian Affiliate of a Foreign Company is the Bidder*, Bidder qualification credentials can be of their Holding Company/ Subsidiary / any other Subsidiary of the Holding Company, subject to such conditions as herein after mentioned.

- a) Financial Credentials of the holding/subsidiary/ any other subsidiary of holding company of bidding entity should be acceptable based on undertaking by the qualified holding / subsidiary/ any other subsidiary of the holding company supporting the bidding entity (Indian Affiliate), if selected for award.
- b) Technical Experience of the holding/subsidiary/ any other subsidiary of holding company, of bidding entity should be acceptable based on undertaking by the qualified holding / subsidiary/ any other subsidiary of holding company supporting the bidding entity, if selected for award.
- c) The Indian Affiliate of a Foreign Company shall be in existence for the last 8 (eight) years (ending on last day of the month immediately previous to the month in which last date of original bid submission falls) and with a present (on the day of floating this tender) minimum Manpower of 1000 People (Technical) in their rolls in India and shall provide undertaking along with the bid.
- d) In case the bidder uses the credentials, Technical and / or Financial, of its Holding Company / any other Subsidiary of the Holding Company / Subsidiary of the bidder, for meeting the PQ criteria, then all the parties i.e. bidder, Subsidiary of the bidder, Holding Company of the bidder and any other Subsidiary of the Holding Company of the Bidder, shall be jointly and severally liable for the performance of the contract. A Notarized Declaration by each such party to this effect shall be submitted with the bid under the signature of an authorized signatory of the respective parties mentioned above as per the format herewith (**Annexure-V**), which shall be part of the contract which may be awarded to successful bidder.

In case the Holding Company of the bidder is not able to execute the Notarized Declaration as mentioned above, then the Holding Company of the Bidder shall submit along with the bid a Corporate Guarantee, as per the format herewith **Annexure-VI**, which will be effective in case the bid is successful and this Corporate Guarantee shall be part of the contract awarded to the successful bidder.

Additional Note/ conditions in case the bidder is **a Foreign Bidder**:

- (ii) **In case where Foreign Bidder bids on its own**, Bid qualification credentials can be of their own subject to such conditions as herein after mentioned;

The Foreign bidder should have an Indian office/ Indian arm with a present minimum Manpower of 1000 People (Technical) in their rolls in India and shall provide undertaking along with the bid

Note: For the purposes of these instructions "FOREIGN BIDDER" means any entity / corporation / company not incorporated / registered in India and Indian Office/ "Indian Arm" means a Company incorporated / registered in India and owned and controlled by the FOREIGN entity where:

- **"OWNED"** means the legal and beneficial OWNERSHIP of more than 50% of the issued and subscribed equity shareholding of the Indian Company either directly or through a company which owns directly or indirectly the majority of the issued and subscribed equity shares of the FOREIGN entity and the Indian Company.

- “*CONTROLLED*” means the right to appoint majority of the directors or to control the management and policy decisions through shareholding, management rights or any other manner.

The Foreign Bidder bidding on its own or The Foreign entity (Holding Company/ Subsidiary/ any other Subsidiary of Holding Company) whose credentials have been used by the Indian Affiliate for meeting the qualification criteria shall directly (and not through the Indian Affiliate) undertake the following activities for the Units/ Facilities of Project as minimum and shall provide undertaking along with the bid.

- Participate in preparation and approve/signing off of BDEP/FEED for Process units, as applicable.
- Participate in preparation and approve/signing off of Material Requisition (MR) of critical/Long Lead Items (LLI's) of concerned Units and review of critical vendor drawings.
- Review/ Approval of design of critical equipment and piping systems and identified critical drawings & documents.
- Review/ Approval of manufacturing drawings of critical equipment including Quality Assurance Plan.
- Review & approval of Inspection Test Plan (ITP) for critical equipment
- Participation in preparation and validation of 3D Models (at 30%, 60% and 90 % stages).
- Participation and validation/signing off of HAZOP (Hazard Operability) SIL (Safety Integrity Level) Study of concerned unit.
- Deploy the qualified manpower for any other critical engineering activities as deemed fit & necessary subject to approval of Owner.

5.2 FINANACIAL CRITERIA

5.2.1 ANNUAL TURNOVER:

Average Annual Financial Turnover of the Bidder during the immediate preceding 03 (Three) financial years shall not be less than INR 167 Crores or *USD 19,118,488 or Euro 16,720,064 as per audited annual financial statements. The financial year shall be between April and March or January and December or any date depending on the accounting year of the Bidder.*

5.2.2 NETWORTH:

The Net worth of the bidder as per latest audited financial statement shall be positive.

5.2.3 Bidder should have completed 3 (Three) financial years of existence as on last day of the month immediately previous to the month in which last date of original bid submission falls since date of commencement of business.

5.2.4 EARNEST MONEY DEPOSIT:

EMD Amount: - For Indian Bidders: ₹ 20 lakhs.

For Foreign Bidders: USD 22900 or EURO 20,030

MSE Bidders shall be exempted from EMD.

General Conditions for Financial Criteria:

1. In case a bidder (Holding Company) is having wholly owned subsidiaries but only a single consolidated annual report is prepared and audited which includes the financial details of their wholly owned subsidiaries, consolidated audited annual report shall be considered for establishing the financial criteria subject to statutory auditor/CPA of the bidder certifying that separate annual report of bidder (without the financial data of subsidiaries) is not prepared and audited.
2. In case the bidder uses the credentials, Technical and / or Financial, of its Parent Company / any other Subsidiary of the Parent Company / Subsidiary of the bidder, for meeting the BQ criteria, then all the parties i.e. bidder, Subsidiary of the bidder, Parent Company of the bidder and any other Subsidiary of the Parent Company of the Bidder, shall be jointly and severally liable for the performance of the contract. A Notarized Declaration by each such party to this effect shall be submitted with the bid under the signature of an authorized signatory of the respective parties mentioned above as per the format provided herewith (**Annexure-V**), which shall be part of the contract which may be awarded to successful bidder.

In case the Parent Company of the bidder is not able to execute the Notarized Declaration as mentioned above, then the Parent Company of the Bidder shall submit along with the bid a Corporate Guarantee, as per the format provided herewith (**Annexure-VI**), which will be effective in case the bid is successful and this Corporate Guarantee shall be part of the contract awarded to the successful bidder.

3. Further, in case a bidder is a subsidiary company and separate annual report of the bidder is not prepared & audited, but only a consolidated annual report of the Holding Company is available, consolidated audited annual report shall be considered for establishing the financial criteria subject to statutory auditor/CPA of the holding company certifying that separate annual report of bidder is not prepared and audited.
4. No insolvency, liquidation, court receivership or other similar proceedings shall have been initiated and pending against the Bidder. Bidder shall submit a self-certificate stating that they are not under insolvency, liquidation, court receivership or similar proceedings. Failure to do so or if the bidder is under insolvency, liquidation, court receivership or similar proceedings, their bids shall not be considered.
5. In case the financial year closing date is within 6 months of original bid due date and audited annual report of immediate preceding financial year is not available, Bidder has the option to submit the financial details of the three previous years immediately prior to the last financial year. In case the financial year closing date is within 6 – 9 months of original bid due date and Audited annual report of immediate preceding financial year is not available, Bidder has the option to submit the financial details of the three previous years immediately prior to the last financial year provided Bidder submits a letter from CA/CPA stating the reasons of non-preparation/furnishing of the latest year's Audited Financial Statements.

In case the financial year closing date is beyond 9 months of original bid due date, it is compulsory to submit the financial details of the immediate three preceding financial years. Example, in case, audited annual report of immediate preceding financial year (For Example year ending 31st March) is not available and where bid closing date is up to 31st December, the financial details of the three previous years immediately prior to the last financial year may be submitted along with letter from CA/CPA stating the reasons for non-preparation/furnishing of latest year's Audited Financial Statements. However, in case

the bid closing date is after 31st December, it is compulsory to submit the financial details of the immediate three preceding financial years only.

6. In case of foreign bidders, if the annual turnover is in currency other than the USD/EURO, the same shall be converted into equivalent USD considering the conversion factor indicated in Bidder's audited financial report. In case the same is not indicated, the conversion rate of USD as on last date of Bidder's financial year shall be considered based on FBIL (Financial Benchmarks India Pvt Ltd.) reference rate. In the absence of FBIL reference rate, RBI reference rate will be considered. In the absence of both FBIL reference rate and RBI rate, SBI TT (Telegraphic Transfer) reference rate will be considered.

5.3 Additional PQC conditions to be met by Bidder if the-bidder intends to meet the PQC based on credential of its Foreign Holding Company / Subsidiary company / other Subsidiary of Holding Company:

The Bidder on their own must satisfy the following criteria in addition to other criteria mentioned elsewhere in the tender to qualify:

Should possess the experience of having successfully completed following services during the last 15 (Fifteen) years ending on last day of the month immediately previous to the month in which last date of original bid submission falls.

Engineering, Procurement, Construction Management (EPCM) Consultancy Services for any Hydrocarbon Process Unit(s) with or without associated offsite/ offsite & utilities facilities in any Petroleum Refinery / Petrochemical / Hydrocarbon Plant in India/ Abroad. The work shall be of single work order with executed value not less than INR 55 Crores.

OR

Engineering, Procurement and Construction Management (EPCM) Services and PMC services for any Hydrocarbon Process Unit(s) with or without associated offsite/ offsite & utilities facilities in any Petroleum Refinery / Petrochemical / Hydrocarbon Plant in India/ Abroad. The work shall be of single work order with executed value not less than INR 55 Crores.

In case two or more Purchase Order / Work Order have been awarded to the same bidder against an individual tender (i.e. considering offer for these two or more corresponding parts of the tender) with nature of work as mentioned above, these two or more Purchase Order / Work Order shall be considered as one Purchase Order / Work Order awarded to the bidder for PQC evaluation purpose. Two or more purchase orders can be combined and can be considered as single purchase order only if those two or more purchase orders are issued under the same tender.

The above referred hydrocarbon process unit should have been commissioned within the last 15 (Fifteen) years (ending on last day of the month immediately previous to the month in which last date of original bid submission falls) and completed 12 (twelve) months of operation.

The reference units should be a commercial unit (pilot plant, laboratory scale plant, demonstration plant, etc are not acceptable). Exclusive experience of Utility System / Utility block, wastewater effluent treatment, offsite facilities, etc. shall not be considered as relevant experience. Experience of offshore facilities shall not be considered as relevant experience above.

Commissioning certificate from the plant owner shall be submitted by the bidder.

For satisfactory operation for at least 12(twelve) months after commissioning any of the following documents is required to be submitted:

a. Certification for satisfactory operation for 12(twelve) months from client.

OR

b. Certification of completion of performance guarantee & test run (PGTR) with completion date at least 12 (twelve) months prior to original bid submission.

The Average Annual Turnover shall be equal to or more than INR 55 Crores during the immediately preceding three financial years. The net worth as per latest audited financial statement shall be positive. Proof of Annual Turn Over (ATO) and net worth shall be submitted in the form of complete set of Audited Financial Statement along with Independent Auditor's Report.

5.4 DOCUMENTS AND DATA REQUIRED WITH BID

Bidder should submit documentary evidence to support the references provided and fulfilling the PQC. The following are the minimum documents required.

- (i) For 5.1 (Technical Criteria) - Bidder is required to submit detailed work order (s) including covering letter and schedule of rates and completion certificate containing executed value of work along with the details of the contact person. It shall be mandatory for the bidder to submit valid documentary proof (copy of work order along with scope of work, Mechanical Completion certificate / certification issued by Client/ Plant Owner and commissioning certificate / certification duly certified by plant owner/ Client) for compliance with above stated requirement. Value of the works is not essential for documents submitted for 5.1.1.3.
- (ii) In addition to the other particulars required, the bid shall contain full particulars of the FOREIGN bidder, foreign company of the Indian affiliate and/or of the Indian Affiliate and shall provide all information necessary to satisfy BPCL that the Indian Affiliates with the necessary back up and support of the FOREIGN entity will be able to perform the obligations of the Consultant and provide the required Consultancy Services in the same manner and to the same standard as could be provided by the FOREIGN entity.
- (iii) Bidder shall furnish documentary evidence towards financial criteria along with the Bid such as copies of complete set of Audited Financial statements along with the independent Auditor's Report for the immediately preceding three financial years to establish Financial Criteria. In case of refusal to submit requisite documents, BPCL reserves the right to reject the Bid without making any reference to the Bidder.
- (iv) BPCL or their appointed third-party agency reserves the right to check the authenticity of the documents and may seek the original documents which substantiates the Bid Qualification Criteria for verification purpose. In case the bidder(s) fails to produce/provide the original documents mentioned above, their offer will be rejected.
- (v) BPCL reserves the right to directly interact with the Bidder's clients to verify the relevant documentation, and the Bidder will render assistance in facilitating the same.
- (vi) In case the bidders are submitting the documents in a language other than English, proper English translation by recognized translators such as Indian consulate in the country of origin or the representative country's consulate in India or any accredited translating institute shall be accepted.

The total cost incurred for submission of bid including PQC supporting documents shall be borne by the bidder.

5.5 REQUIREMENT OF AUTHENTICATION AND SUBMISSION OF DOCUMENTS:

5.5.1 AUTHENTICATION:

Submission of authentic documents is the prime responsibility of the bidder. The bidder shall ensure submission of complete authentic information/ documentation along with the bid. No amount of checking or verification by the Owner shall absolve bidder from his responsibility. Moreover, the bidder's organization is responsible for any and all actions of their employees and any claims seeking to pinpoint the blame on some employee of bidder and attempting to absolve the bidder's organization will not be entertained. Wherever BPCL has concern or apprehensions regarding the authenticity/correctness of any document, BPCL reserves the right to get the documents cross-verified from the document issuing authority.

5.5.2 Verification of original documents required for Bid Qualification Criteria:

(A) For Indian Bidders

A1. Technical Criteria

Undertaking by bidders towards submission of TPIA verified documents to be submitted during submission of bid:

A separate undertaking to be submitted by all bidders towards submission of TPIA verified documents participating through open tenders as per the format given in the tender. Bidder(s) need not provide TPIA verified documents along with bid. They need to provide only undertaking as per **format (Annexure-VII)** giving assurance to submit TPIA verified documents in case they are successful bidder. Refusal to submit the undertaking by the bidder to be considered as one of the rejection criteria for bid evaluation.

Verification of documents of successful bidder:

Once the price bids are opened, the successful bidder shall be given notification to submit TPIA verified documents within 5-days' time along with self-undertaking and TPIA's undertaking as per **format (Annexure-VII B and Annexure-VIII)** given in the tender. If a successful bidder fails to submit TPIA documents, then necessary action to be initiated as per guidelines.

Note:

- i) In case of Work Order / Purchase Order issued by BPCL, certification by TPIA is not mandatory.
- ii) All Copies of BQC supporting documents to be submitted by successful bidder for this tender should be duly verified with originals & attested by TPIA which is registered under "NABCB accredited bodies as per requirement of ISO/IEC17020/25 as Type A" in QCI's NABCB website as on the date of attestation.
- iii) Cost of TPIA certification shall be borne by the bidder.

A2 Financial Criteria

For meeting the financial criteria, bidder shall submit with the bid the complete set of audited annual financial statements or a letter from the statutory auditor/ Chartered Accountant (CA)/ Certified Public Accountant (CPA) (as per **Annexure-A** enclosed) or a

letter from the bidder duly certified by statutory auditor/ Chartered Accountant (CA) / Certified Public Accountant (CPA) (as per **Annexure-B** enclosed) for the preceding 3 financial years.

The above financial details, as per **Annexure-A or B**, shall be submitted without any reservation/qualification remarks.

Note: CA/CPA Certificate (CA/CPA not being an employee/Director and not having any interest in the bidder's company) is acceptable where audited accounts are not mandatory as per law of bidder's country (in line with the present system) and declaration in this regard is given by CA/CPA.

(B) For foreign bidders

Undertaking by bidders towards submission of verified documents to be submitted during submission of bid:

A separate undertaking to be submitted by all bidders towards submission of verified documents participating through open tenders as per the format given in the tender. The undertaking shall be from either the MD, CEO, CFO, **Director** or Company Secretary of the entity. Bidder(s) need not provide verified documents along with bid. They need to provide only undertaking as per **format (Annexure-VII)** giving assurance to submit verified documents as per the requirement mentioned in clause B1 and B2 below of 5.5.2, in case they are successful bidder. Refusal to submit the undertaking by the bidder to be considered as one of the rejection criteria for bid evaluation.

Verification of documents of successful bidder:

Once the price bids are opened, the successful bidder to be given notification to submit verified documents within 5-days' time along with self-undertaking and third party undertaking as per **format (Annexure-VII B and Annexure-VIII)** given in the tender. If a successful bidder fails to submit verified documents, then necessary action to be initiated as per guidelines.

B1. Technical Criteria:

All the bidding documents related to technical qualification Criteria should be duly certified, signed, dated and stamped by:

a. An official authorized for this purpose in Indian embassy/ High commission in Bidder's country.

OR

b. Local chamber of commerce in bidder's country.

OR

c. TPIA which is registered under "NABCB accredited bodies as per requirement of ISO/IEC17020 as Type A" in QCI NABCB <https://nabcb.qci.org.in/inspection-body/> as on date of verification of documents, If there are no changes in the document data and the document is already verified & attested by the above independent third-party inspection agency (TPIA), such verified documents can be submitted for qualifying the PQC without again verification and attestation from above TPIA.

OR

d. The above referred TPIA's group company available in the bidder's country.

In case of Work Order / Purchase Order issued by BPCL, certification by (a/b/c/d mentioned above) is not mandatory.

B2. Financial criteria:

Bidder shall submit with the bid the complete set of audited annual financial statements or a letter from the statutory auditor/ Chartered Accountant (CA)/ Certified Public Accountant (CPA) (as per **Annexure-A** enclosed) or a letter from the bidder duly certified by statutory auditor/ Chartered Accountant (CA) / Certified Public

Accountant (CPA) (as per **Annexure-B** enclosed) for the preceding 3 financial years.

The above financial details, as per **Annexure-A or B**, shall be submitted without any reservation/qualification remarks.

Note: CA/CPA Certificate (CA/CPA not being an employee/Director and not having any interest in the bidder's company) is acceptable where audited accounts are not mandatory as per law of bidder's country (in line with the present system) and declaration in this regard is given by CA/CPA.

All the bidding documents related to financial qualification Criteria should be duly certified, signed, dated and stamped by:

a. An official authorized for this purpose in Indian embassy/ High commission in Bidder's country.

OR

b. Local chamber of commerce in bidder's country.

OR

c. TPIA which is registered under "NABCB accredited bodies as per requirement of ISO/IEC17020 as Type A" in QCI NABCB

<https://nabcb.qci.org.in/inspection-body/> as on date of verification of documents, If there are no changes in the document data and the document is already verified & attested by the above independent third-party inspection agency (TPIA), such verified documents can be submitted for qualifying the PQC without again verification and attestation from above TPIA.

OR

d. The above referred TPIA's group company available in the bidder's country.

This requirement of above certification shall not be applicable to published audited annual financial statements in English if original booklets are submitted.

BPCL or their appointed third-party agency reserves the right to check the authenticity of the documents and may seek the original documents which substantiates the Bid Qualification Criteria for verification purpose. In case the bidder(s) fails to produce/provide the original documents mentioned above, their offer will be rejected.

INSTRUCTIONS TO BIDDERS

1.0 GENERAL**1.1 Introduction**

Bharat Petroleum Corporation Ltd. ("BPCL") is a Central Public Sector Undertaking with a "Maharatna" status. BPCL is an integrated oil company engaged in refining of crude oil and marketing of petroleum products. BPCL operates 3 refineries in India including Mumbai Refinery (12 MMTPA), Kochi Refinery (15.5 MMPTA), and the Bina Refinery (7.8 MMTPA).

Mumbai Refinery (MR) has crude processing capacity of 12.0 Million Metric Tonnes per Annum (MMTPA). The refining capacity has been augmented to the present level through progressive revamps, addition of various process units and incorporation of advanced refining technologies.

BPCL intends to set up a PRFCC unit to maximize propylene and transport fuel & minimize bottoms from Mumbai Refinery (MR).

1.2 Confidentiality of Document

1.2.1 The Bidding Document is non-transferable.

1.2.2 The Bidding Document are and shall remain the exclusive property of the OWNER with a right for the Bidder to use it only for the intended purpose of bidding and for use by the successful Bidder with reference to the resultant Contract for the Owner's subject Unit.

1.2.3 The Bidder shall take due measures to keep the documents secret and confidential (wherever specifically mentioned) and shall disclose the Bidding Document and/or furnish copies in whole or part thereof to employees involved in the preparation of the Bid who have understood the proprietary and confidential nature of the documents and have undertaken to be bound by and maintain confidentiality.

1.3 Cost of Bidding

1.3.1 All direct and indirect costs associated with the preparation and submission of bid (including clarification meetings and site visit, if any), shall be to Bidder's account and Owner will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

1.4 Site Visit

1.4.1 Bidder is advised to visit and examine the site on the date mentioned in IFB/LIB, its surroundings and familiarise himself with the existing facilities and environment, and collect all other information including applicable laws, which he may require for preparing and submitting the bid and entering into the Contract. Claims and objections due to ignorance of existing conditions or inadequacy of information will not be considered after submission of the bid and during implementation.

The Bidder and any of his personnel or agents will be granted permission by the Owner to enter upon his premises and land for the purpose of such inspection, but only upon the explicit condition that the Bidder, his personnel or agents will release and indemnify the Owner and his personnel and agents from and against all liability in respect thereof and will be responsible for personnel injury (whether fatal or otherwise), loss of or damage to property and any other loss, damage, cost and expenses incurred as a result thereof.

2.0 BIDDING DOCUMENT, CLARIFICATION AND AMENDMENT**2.1 Bidding Document**

2.1.1 The Bidding Document shall be read in conjunction with any amendment issued subsequently.

2.1.2 The Bidder is expected to examine the Bidding Document, including all instructions, terms, specifications and drawings in the Bidding Document. Failure to furnish all information

required as per the Bidding Document or submission of a bid not substantially responsive to the Bidding Document in every respect could result in rejection of the Bid.

2.1.3 Bidding Document is non-transferable and shall at all times remain the exclusive property of Owner with a license to the Bidder to use the Bidding Documents for the limited purpose of submitting the bid.

2.1.4 The Document comprising following sections are uploaded on websites for the purpose of submitting Bid.

- i) Invitation for Bids (IFB) including all its Annexures
- ii) Instructions to Bidders including all its Annexures
- iii) Special Conditions of Contract (SCC)
- iv) General Conditions of Contract (GCC)
- v) Schedule of Prices
- vi) Technical Section / Scope of Work / Techno-Commercial Document
- vii) All Annexures, Forms and other related tender attachments.

2.1.5 The documents can be downloaded from e-procurement Portal. Any Amendment/ Addendum issued hereinafter shall also form part of the Bidding Document.

All Amendments, time extension, clarifications etc. will be uploaded in the e-procurement portal only. Bidders should regularly visit e-procurement portal to keep themselves updated. Amendment includes Corrigendum/Addendum etc.

Request for extension or any queries received from any bidder with less than two working days prior to bid due date shall generally be ignored, since there will not be adequate time for proper inter departmental communication and with other Bidders. Bidders shall submit the bid directly and in their own name without involving any intermediaries.

2.1.6 "Bidder" shall mean the Contractor who has submitted the Bid for the services described in this Bidding Document.

2.2 Clarification Requests by Bidder

2.2.1 The details presented in this Bidding Document have been compiled with all reasonable care. However, it is the Bidder's responsibility to ensure that the information provided is adequate, clearly understood and it includes all documents as per the Index.

2.2.2 Bidder shall examine the Bidding Document thoroughly in all respects and if any conflict, discrepancy, error or omission is observed, Bidder may request clarification up to 3 days prior to Pre-Bid Meeting date. Such clarification requests shall be directed to the emails mentioned in Invitation for Bid (IFB).

2.2.3 Response to queries/ clarifications raised will be sent as expeditiously as possible. The response shall not form part of Bidding Document unless issued as an Amendment.

2.2.4 Bidders are expected to resolve all their clarifications/ queries to the Bidding Document and submit their bid in total compliance to Bidding Document without any deviation / stipulation / clarification.

2.2.5 Any failure by Bidder to comply with the aforesaid requirement shall not excuse the Bidder, after subsequent award of Contract, from performing the Work in accordance with the Contract.

2.3 Amendment of Bidding Document

2.3.1 Owner may, for any reason whether at his own initiative or in response to the clarification requested by the prospective bidder(s), issue modifications/changes/clarifications in the form of Amendment during the bidding period or subsequent to receiving the bids. Any Amendment thus issued shall become part of Bidding Document and Bidder shall upload along with their bid, the scanned copy of the Amendment duly signed and stamped as a token of his acceptance.

2.4 MULTIPLE / ALTERNATIVE BID

- 2.4.1** A bidder (i.e. the bidding entity) shall, on no account submit more than one bid either directly (as a single bidder or as a member of consortium) or indirectly (as a sub- contractor) failing which following actions shall be initiated:
- 2.4.2** All bids submitted by such bidder (say 'A') either as a single bidder or as a consortium, shall stand rejected and BID SECURITY, if any, in case of all such bids submitted by bidder 'A' shall be forfeited.
- 2.4.3** If another bidder (say 'B') has proposed bidder 'A' as a sub-contractor then bidder 'B's' bid shall also be rejected. However, in case the bidder 'B' has also proposed an alternative subcontractor who is other than the bidder 'A', then bidder 'B's' bid shall be evaluated with the proposed alternative sub-contractor only. Hence, every bidder shall ensure in his own interest that his proposed sub-contractor is not submitting alternative/ multiple bid."
- 2.4.4** A sub-Contractor can be common to more than one Bidder, provided the sub-Contractor themselves are neither a Bidder nor a consortium member.
- 2.4.5** In case of any discrepancy between the provisions stipulated in the IFB / Technical BQC and this clause, the provisions stipulated in the IFB / Technical BQC shall supersede.

2.5 POWER OF ATTORNEY

- 2.5.1** The bidders shall be required to submit the Power of Attorney (POA), in original, in addition to submission of a copy in e-procurement portal along with the e-Bid, in the name of authorized signatory signing the Bid on behalf of the bidder's company / firm and subsequent submissions on behalf of the Bidder. However, in case of General Power of Attorney, photocopy duly notarized / signed by any Functional Director in the Board of Directors is also acceptable. Non submission of POA in Original shall lead to rejection of the e-Bid.
- 2.5.2** The cancellation of any document such as Power of Attorney, Partnership Deed, etc. should be promptly communicated by the Bidder to the Owner in writing well in time, failing which Owner shall have no responsibility or liability for any action taken by Owner on the strength of the said documents.

3.0 PREPARATION AND SUBMISSION OF BIDS**3.1 e-Procurement Portal**

- 3.2** The bid shall be submitted through e-procurement portal: <https://bpcltenders.eproc.in> only. Bidders are requested to get acquainted with the portal and load their Bid well within the time provided for bid submission to avoid last minute hassles.

3.3 COMPLIANCE TO BIDDING DOCUMENT REQUIREMENT

- 3.3.1** **OWNER expects Bidder's compliance to requirement of Bidding Document without any deviation. The bid containing exceptions/ deviations on the following stipulations/ conditions shall be rejected.**

- i. Time Schedule
- ii. Schedule of Price
- iii. Defect Liability Period
- iv. Price Reduction / Liquidated Damages due to delay
- v. EMD/ Security Deposit/ Contract Performance Guarantee
- vi. Bid Validity
- vii. Payment Terms

viii. Guarantees and Liabilities

ix. Bid Qualification Criteria and Bid Evaluation Methodology

x. Declaration for Land Border Policy

xi. Integrity Pact

xii. Non acceptance of GOI / statutory directives

3.3.2 Deviation on other clauses should also be avoided. However, if felt absolutely necessary should be furnished in the techno-commercial bid (and not in Bidding Document or price bid) as per **ANNEXURE-II** (given in Section 2A). Owner shall not take cognizance of any deviation stipulated elsewhere in the bid. If no deviations are stipulated, then the same shall be confirmed as per **ANNEXURE-I** (given in Section 2A). Deviations, if accepted shall be loaded on the quoted price, wherever applicable. In case deviations sought by Bidder is not acceptable to Owner, Owner reserves the right to reject bid at its absolute discretion.

3.3.3 Bidder in their own interest shall submit Bid fully complying with Bidding Document requirements and Owner shall reserve the right to proceed with the available compliant bids for evaluation and Technical Queries (TQ) / Commercial Queries (CQ) may not be issued once the bid has been opened. However, wherever TQ / CQ are unavoidable, Owner at its discretion may issue TQ/CQ for bidder to reply within the cut-off date along with all relevant documents / information / clarification / confirmation as required with the TQ / CQ reply(ies). Owner reserves the right not to consider any reply after the cut-off date to complete the bid evaluation process.

3.3.4 For cases where Bidders are required to meet Pre-Qualification Criteria (PQC) and the documents submitted along with the bid are not fulfilling the BQC requirement, Bidders shall be allowed to submit additional document for any of the work out of the past experience(s) list already submitted along with the bid, to support their meeting the BQC. **Bidders shall submit a list mentioning all their relevant past experiences along with the bid.**

3.3.5 Bidders shall not be permitted to submit document related to new reference of work experience if not mentioned in the list (past experience) submitted along with the bid and any such submission shall not be considered for evaluation.

3.4 Language of Bid

3.4.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the bidder and owner, shall be in the English language. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the English language, in which case, for purposes of interpretation of the Bid, such translation shall govern.

The Bid and all correspondence incidental to and in connection with the Bid shall be in the English Language only. In case a foreign bidder submits any of the Bidder Qualification support documents in any language other than in English, then it shall be the responsibility of such foreign Bidder to also provide the English translation copy of the same duly certified by either of the following:

- a) Local Chamber of Commerce.
- b) Indian Embassy in Bidder's Country
- c) Bidder's Embassy in India
- d) Any translator in India recognized/ authorized by Bidder's Embassy

3.5 Schedule of Prices

The Schedule of Prices shall be read in conjunction with all other sections of the Bidding Document. Rates/ amount must be filled in the format of Schedule of Prices enclosed as part of this Bidding Document.

The Prices quoted by the Bidder shall be firm and fixed for the completion period of the offered services and supplies and in accordance with the price schedule format enclosed and strictly based on the terms specified related to the bid prices in the instructions / conditions.

Firm prices are required for all the items of Schedule of Prices.

Bidder shall quote all the items of Schedule of Prices after careful analysis of cost involved for the performance of the completed item considering all parts of the Bidding Document. In case any activity is specifically not covered in description of item under Schedule of Prices but is required to complete the work as specified elsewhere in the Bidding Document, then the quoted prices for the item shall be deemed to be inclusive of cost incurred for such activity and no claims whatsoever on this account shall be entertained by Owner.

3.6 Documents Comprising the Bid

3.6.1 The offer must be complete in all respects, leaving no scope for ambiguity. Bidder is fully responsible for the bid submitted and no relief or consideration can be given for errors and omissions.

3.6.2 The bid shall contain no interlineations, erasures or overwriting except as necessary to correct errors made by the bidder, in which case, such corrections shall be signed in full by the person or persons signing the bid.

3.6.3 Bidder is advised that Owner or Project Management Consultant (PMC)/ Owner's Management Consultant (OMC), appointed by owner, shall fully evaluate the technical and unpriced commercial submissions. It is important that Bidder clearly demonstrates his experience and capability, giving Owner/PMC/OMC a high level of confidence about the technology being licensed and also that if awarded, the Bidder will be able to perform within the stipulated Time Schedule and quoted price total scope requirements listed in the Bidding Document. Bidder is requested to furnish complete and correct information required for evaluation of their Bid irrespective of whether it is specifically asked or not.

3.6.4 The Bid shall be submitted in two parts viz. Part-I and Part-II in respective folders provided in the website.

PART-I EMD / Bid Security / Pre-Qualification /Techno-commercial / Un-priced Bid

PART-II Priced Bid

3.6.5 PART-I: EMD/Bid Security:

(i) Earnest Money Deposit / Bid Security, in the form of NEFT / RTGS / Bank Guarantee/ Insurance Surety Bond of requisite amount in favour of "BHARAT PETROLEUM CORPORATION LIMITED" payable at Mumbai, Maharashtra, India, as stipulated in IFB, shall be submitted in the following manner:

- Original EMD (NEFT / RTGS / BG / Insurance Surety Bond): Within 7 days from the Bid Due Date & Time
- Copy of Original EMD: Scanned & uploaded in E-Tendering Portal.

3.6.6 PART-I: PQC/ BQC Bid:

All PQC related supporting documents should be signed/ stamped on all pages and should be uploaded in the un-priced bid.

3.6.7 PART-I: Techno-commercial / Un-priced Bid:

All documents should be signed/ stamped on all pages with other supporting documents (as mentioned in the bidding document) and should be uploaded in attached format. Bidder

to submit un-priced copy of SOR (Schedule of Rates) with an indication as “Quoted” or “Not Quoted” against each item. Bidder should not indicate prices in the un-priced bid.

The document shall include minimum of the following.

- 1) Cover letter for submission of bid
- 2) Information about any current litigation / arbitration, if any, in which bidder is involved.
- 3) Unpriced copy (without price) of complete Schedule of Prices document replacing Price figures with words “Quoted/Not Quoted” (as applicable), duly scanned, signed and stamped on each page.
- 4) Technical offer and engineering details, if any, required as per Bidding Document.
- 5) Exception and Deviation Form
- 6) Self-certificate that the bidder is not under liquidation, court receivership or similar proceedings. Bidder shall confirm that such proceedings have NOT been initiated and pending against them and shall submit a self-certificate stating that they are not under insolvency, liquidation, court receivership or similar proceedings. Failure to do so or if the bidder is under insolvency, liquidation, court receivership or similar proceedings, their bids shall not be considered.
- 7) Self-certificate that the Bidder have not been placed on any holiday list or black list declared by BPCL or MoPNG as per IFB.
- 8) Any other relevant Form / Annexure/ Information required in the Bidding Documents.

For convenience, the Bid shall be compiled in the form of specific Sections conforming to the above. In case of non-submission of above documents or submission of incomplete documents, the OWNER / reserves the right not to evaluate such offers further and not to enter into correspondence in this regard after opening the Techno-commercial / Unpriced Bid.

NOTE: The Institute of Chartered Accountant of India at its 379th council meeting dated 17- 18th December, 2018 made generation of Unique Document Identification Number (UDIN) mandatory for every signature of full time practicing chartered accountant for the following service:

- a) All certificates with effect from 1st February, 2019.
- b) GST and Income Tax audit with effect from 1st April, 2019.
- c) All audit and assurance functions with effect from 1st July, 2019.

In view of the above, bidder shall ensure that any certificate / reports issued / attested by a practicing chartered accountant in India and submitted in the bid shall mandatorily include the UDIN number. Certificate / reports issued / attested without UDIN number of practicing Chartered accountant in India shall not be considered for evaluation.

This requirement of including UDIN shall not be applicable for certificate / reports issued / attested by a chartered accountant practicing in foreign country.

3.6.8 PART-II: Priced Bid shall be submitted separately and shall consist of the following:

- i) Preamble to Schedule of prices
- ii) Total Schedule Prices as per formats given in the Schedule of Prices **and its subsequent amendments (if any)**, duly filled-in with prices & completed in all respect, shall be submitted.

This part shall not contain any condition whatsoever failing which the Bids shall be liable to be rejected. No stipulation, deviation, terms & conditions, presumption, basis etc. shall be stipulated in Price Part of the bid. Any condition if stipulated shall be treated as null and void and shall render the bid liable for rejection.

3.6.9 SUBMISSION OF ORIGINAL DOCUMENTS: EMD**3.7 Bid Prices**

3.7.1 Unless otherwise permitted in the Bidding Documents, the bid shall be for the whole job.

3.7.2 Bidder shall quote price after careful analysis of cost involved for the performance of the work considering all parts of the Bidding Document. In case any activity though specifically not covered in description of item under SOR/SOP but is required to complete the work as per scope of work, scope of supply, specifications, standards, drawings, GCC, SCC or any other part of Bidding Document, the prices quoted shall be deemed to be inclusive of cost incurred for such activity. Schedule of Prices (SOP) and Schedule of Rates (SOR) have been used interchangeably in this document and shall mean the same thing.

3.7.3 The Bid price is to be filled in the formats given in Price Schedule.

3.7.4 The quoted prices shall remain firm, fixed and valid until completion of the Contract performance and will not be subject to variation on any account except as otherwise specifically provided in the Bidding Document.

3.8 Currencies of Bid & Payment

3.8.1 Bidder shall quote the prices in Indian Currency (Indian Rupees) or US Dollars (USD) or Euro only.

3.8.2 No other currencies shall be allowed other than Indian Rupees/USD/Euro as stated above.

3.9 Bid Validity

3.9.1 The Bid shall remain valid for acceptance for a period of **180 days** from the due date of submission of the bid. The Bidder shall not be entitled during the said period to revoke or cancel his bid or to vary the bid except and to the extent required by Owner / in writing.

3.9.2 Owner may request the bidder for extension of the period of validity of bid. If the bidder agrees to the extension request, the validity of Bank Guarantee towards EMD/Bid Security shall also be suitably extended. Bidder may refuse the request of extension of bid validity without forfeiting his EMD/Bid Security. However, bidders agreeing to the request for extension of validity of bid shall not be permitted to modify the bid because of extension, unless specifically invited to do so.

3.10 Earnest Money Deposit / Bid Security:

3.10.1 EMD / Bid Security: EMD / Bid Security is required in all cases **except for MSE bidders (bidder to submit MSE certificate along with CA certificate/NSIC certificate against the same)**. Bids not accompanied with the EMD shall be rejected and shall not be considered for further evaluation. Amount of EMD shall be as indicated in IFB.

3.10.2 Earnest Money Deposit shall be submitted in the form of Electronic Funds Transfer to BPCL Bank Account / Bank Guarantee executed by any Scheduled Bank approved by Reserve Bank of India (as per Proforma provided in GCC Annexure) / Insurance Surety Bond (as per Proforma provided in GCC Annexure).

Earnest Money Deposit (EMD) shall be valid for a period of 6 (Six) months from the due date of opening of Techno-commercial Bids and shall be submitted from any Indian Scheduled Commercial Bank / Indian Branch of Foreign Bank. EMD submitted by foreign vendors shall be in USD / EURO only.

EMD/ Bid Security shall be submitted in favour of Bharat Petroleum Corporation Limited, in the form of non-revocable Bank Guarantee on non-judicial stamp paper of appropriate value (mentioned in IFB) and in the prescribed proforma enclosed with bidding document.

3.10.3 Micro or Small Enterprises (MSEs) shall not be required to submit Bid Security. Bidder claiming to be a Micro or Small Enterprises (MSEs) for the purpose of availing various benefits defined for MSEs in the bidding document shall review and ensure their status as Micro or Small Enterprises as per Government Notification and confirm specifically that:

They are Micro or Small Enterprises (as the case may be), as on the bid due date, as per the guidelines for re-classification of micro, small and medium enterprises notified by Ministry of MSME vide Gazette Notification no. 2119 (E) dated 26.06.2020. (Latest

Guidelines/ Circulars/ Notifications issued by competent authorities shall be applicable.)

Bidder will be required to submit the Udyam Registration Certificate along with Certificate from Chartered Accountant (in format attached with Tender document) confirming eligibility for benefits of public Procurement policy as per MSMED Act 2006 -or - Udyam Registration Certificate along with valid NSIC certificate in support of their MSE status.

Owner/ reserves the right to verify MSE certificate submitted by the bidder.

Scanned copy of EMD shall be uploaded in designated place in the e-tender portal. Cheque/Cash shall not be acceptable. In case, bidder fails to upload scanned copy of EMD on the portal by the bid due date & time, such bid shall not be considered for evaluation.

The Bank Guarantee / Insurance Surety Bond submitted in lieu of EMD/ Bid Security shall be submitted in Original physical form at Mumbai Refinery site within 7 days from the final bid due date & time.

- 3.10.4** EMD of un-successful Bidder shall be returned after award of work to the successful Bidder. EMD of late bids which were not submitted on e-portal with the stipulated due date & time, shall be returned immediately. EMD of the successful bidder shall be returned after the order / contract is effective and Contract Performance Bank Guarantee is submitted by the successful bidder.
- 3.10.5** In case Owner/ decides to cancel / annul the Enquiry / Bidding Document at any stage, during the bidding process but before the award of work / items (as applicable), EMD of the bidders shall be returned at the earliest from the date of such decision.
- 3.10.6** The Bank details for depositing EMD is given below.

(A) For EMD submission in USD, refer below EEFC account details:

The Following is confirmation of BPCL bank account details:

Beneficiary Details

Beneficiary's Name	Bharat Petroleum Corporation Limited
Beneficiary's Bank Name	State Bank of India
Beneficiary's Branch Name	CAG Branch, Mumbai
Beneficiary's Account Number	36010165409
Beneficiary Bank's Swift Code	SBININBB162
Type of Account	EEFC Account
Branch Code	09995

Corresponding Bank Details

Name & Address	State Bank Of India, New York
Routing No	026009140
Swift Code	SBINUS33

(B) For EMD submission in INR (NEFT/RTGS), refer below account details:

EMD can be also submitted through NEFT electronic fund transfer to the Account of BPCL.

Bank details shall be as follows :

Name of the Beneficiary as per Bank Record : BHARAT PETROLEUM CORPN LTD.

NAME OF THE BANK: STANDARD CHARTERED BANK

NAME OF THE BRANCHEH: M.G. ROAD

ADDRESS OF THE BANK 90, M G ROAD, FORT, MUMBAI - 400 001

NEFT IFSC CODE SCBL0036001

9 DIGIT MICR CODE 400036002

TYPE OF AC/C11 (CURRENT)

ACCOUNT NO. 22205020115

(C) EMD can be also submitted in the form of BG or Insurance Surety Bond:

(Refer **FORM-2** and **FORM-3** attached in Section-2B for the BG Format and Proforma of Insurance Surety Bond respectively).

Original BG or Insurance Surety Bond towards EMD shall be sent separately at the following address:

C/o Proc. Manager (CPO - PRFCC)
Administration Building, South Block, 2nd Floor,
Mumbai Refinery,
Bharat Petroleum Corp Ltd,
Mahul, Chembur,
Mumbai - 400 074.

Copy of the BG or Insurance Surety Bond along with proof of dispatch to be uploaded at location specified for the same in the e-tender. Bids without EMD are liable to be rejected.

If vendor is intending to submit EMD in BG format the receiving bank shall be ICICI bank (Details mentioned in below clause).

3.10.7 Bank details for SFMS confirmation of BG (EMD/ABG/CPBG) is as follows:

Instructions for submitting the Bank Guarantee is as follows:

Vendor shall insist their bank for issuance of SFMS Bank Guarantee for faster payments. Vendor shall provide BPCL's Bank Account No. & IFSC Code (Details given below) to their Bank as beneficiary at the time of application for Bank Guarantee in favour of BPCL. Issuing Bank shall issue the Bank Guarantee & send SFMS message to BPCL's Bank confirming the authenticity of Bank Guarantee who in turn shall send the confirmation to BPCL. Vendor should ensure the following for issue of e-bank guarantee.

- a) The issuing bank is on SFMS platform.
- b) SFMS Message type used is 760 COV and SFMS Delivery report /Message copy is sent along with original BG.
- c) For BG amendment, message type 767COV is to be used.
- d) SFMS contains following details:
 - i. Beneficiary's bank name: ICICI Bank
 - ii. IFSC Code: ICIC0000393
 - iii. BPCL's Customer ID: BPCL583493800

- e) BG Issuing bank should send the BG issuance advice through SFMS to BPCL's

- designated banker: ICICI Bank, Backbay Branch, Mumbai (IFSC: ICIC0000393)
- f) BG Issuance advice should mention applicable Unique Identifier Code (UIC) in row/ field number 7037 of SFMS Delivery Report.
- i. BPCL Location: Kharghar, Navi Mumbai
 - ii. Head Office: Ballard Estate
 - iii. UIC: BPCL583493800
- g) The original BG should be submitted along with print out of SFMS Delivery report from the BG Issuing Bank Branch.

SFMS BG will help in faster verification of BGs and prompt release of payment to vendors."

The Bank Guarantee shall be submitted / sent to below mentioned address.

BHARAT PETROLEUM CORPN.LTD.,
BUSINESS PROCESS EXCELLENCE CENTRE (BPEC), 4TH FLOOR,
PLOT NO.6, SECTOR 2, KHARGHAR, NAVI MUMBAI 410210

3.10.8 The EMD may be forfeited:

- i) If the information/documents submitted by the bidder in the Bid is found to be false/forged at any stage of bidding process.
- ii) if a Bidder withdraws its bid during the period of Bid validity specified by the Bidder on the Bid Form, or
- iii) if a Bidder modifies his bid during the period of Bid Validity except if such modification is solicited by OWNER/ in writing, or
- iv) In case of successful Bidder, if the Bidder fails, within the specified period:
 - a. To sign the Contract.
 - b. To furnish the Contract Performance Bank Guarantee.

- 3.10.9** Owner/ shall not pay any interest, commission, bank charges on EMD furnished. Further, in case bank guarantee submitted is found to be fake, bid of such bidder shall be rejected and may initiate action as deemed necessary as per Owner / policy.

4.0 PRE-BID MEETING

- 4.1** The bidder or his authorised representative(s) (limited to 2 persons only) is advised to attend a pre-bid meeting as per schedule given in IFB. The purpose of the meeting will be to clarify issue and to answer questions on any matter that may be raised at that stage by the bidders including site visits.

- 4.2** The bidder is requested to submit any queries/clarification/information pertaining to Bidding Documents in writing delivered by hand or by e-mail as per format enclosed in the Bidding Documents so as to reach us not later than the date specified in the IFB. Queries/Clarifications/Information sought in any other manner shall not be responded to.

- 4.3** The OWNER's responses to Bidder's queries/clarifications raised will be furnished as expeditiously as possible. Any modification of the Bidding Document, which may become necessary as a result of the pre-bid meeting conference, shall be issued in the form of an Addendum/Amendment. Response to Pre-bid Queries and Amendment (if any) shall be uploaded and made available through e-tender website for downloading by Bidders.

5.0 SUBMISSION OF BID

- 5.1** For submission of Bid, please refer instructions to bidders for e-tendering. Due date and time for submission of bids have been mentioned in the IFB.

- 6.0** Deleted

7.0 BID OPENING AND EVALUATION

7.1 Opening of Techno-Commercial Part of Bid

- 7.1.1** Techno-Commercial (Un-priced) Part (Part-I) and Priced (Part-II) part will be opened on the

scheduled date and time. In the event the specified date of bid opening being declared/happen to be a holiday for Owner, the bid shall be opened by the appointed time and location on the next working day.

7.1.2 Bidders can witness bid opening by logging on to the E-Tendering Portal through their system.

7.2 Clarification & Additional Information

7.2.1 Bidder should submit all the details called for along with their bid. However, Owner/ may give opportunity to the bidders to submit missing details or clarifications within certain stipulated time. Offer of bidder will be evaluated based on available details within such stipulated time.

7.2.2 During evaluation, Owner/ may request Bidder for any clarification on the Bid, additional or outstanding documents. Bidder shall submit all additional documents in Original and 1 copy.

7.3 Bid Evaluation Criteria

7.3.1 Prior to detailed bid evaluation, Owner will determine the substantial responsiveness of each bid with respect to the Bidding Documents. Owner determination of a bid's responsiveness is to be based on the contents of the bid itself, as defined in this ITB document.

7.3.2 A substantially responsive bid is one, which conforms to the terms, conditions and specification of the Bidding Documents (including Technical and Commercial Amendments, if any) without any deviation. Bidder shall submit duly signed stamped Total Compliance statement/ Letter of waiver of conditions/ deviations (Refer **Annexure-I**).

7.3.3 All documents furnished by the bidder in support of meeting the technical criteria, commercial experience criteria & financial criteria shall be duly certified and authenticated as mentioned in IFB.

7.3.4 The recommendation for price opening shall be formulated after taking into account the following aspects:

- a) Bidder's qualification as per requirements given in IFB
- b) Technical acceptability of the Bids
- c) Holiday Status of the bidders
- d) Commercial acceptability of bids based on Compliance to requirement of Bidding Document.

7.4 Opening of Price Part of Bid

7.4.1 Priced bid of only those bidders, whose bids are considered techno-commercially acceptable, shall be opened. Bidders can witness bid opening details by logging on to the E-Tendering Portal through their system.

7.5 Evaluation of Bids for award:

7.5.1 The consultant shall be selected for the award of the job based on Overall Lowest Quote basis, after technical and commercial loadings as applicable.

7.5.2 When there is a difference between the prices in figures and words, the price in words shall prevail.

7.5.3 Conditional discount, if offered, shall not be considered for evaluation.

7.5.4 While arriving at the final evaluated prices of all the Bidders, any suo-moto /lump sum percentage or adhoc reduction by the Bidders after submission of the priced bid shall not be considered for evaluation. However, if such bidder happens to be successful bidder after evaluation, such rebate shall be taken into account for award of work.

7.5.5 Any suo-moto /lump sum percentage or adhoc increase by the Bidders after submission of the priced bid shall result in rejection of Bid.

7.5.6 If for any of Taxes & Duties mentioned above the bidder has quoted rates at variance to

the rates specified in the Statute/Rules, the correct rate as per the prevailing Statute/ Rules shall be taken for evaluation.

7.6 Bid Evaluation Process to be Confidential

7.6.1 Information related to the examination, clarification and evaluation of bids shall be maintained confidential. Any effort by Bidder to influence Owner's/ 's processing of bidding or award decisions may result in rejection of such Bidder's bid.

7.7 Owner's Right to Accept or Reject a Bid

7.7.1 Owner reserves the right to accept a bid other than the Successful Bidder and to accept or reject any bid in whole or part, to annul the bidding process or to reject all bids with or without notice or reasons. Such decisions by Owner shall bear no liability whatsoever consequent upon such decisions.

8.0 NEGOTIATION AND AWARD OF WORK

8.1 Negotiation

8.1.1 In the opinion of Owner, if the total price or certain item rates quoted by the successful Bidder are considered high, Owner may invite the successful-Bidder for price negotiation. The successful Bidder shall attend such negotiation meetings and if requested by Owner, bidder shall provide the analysis of rates/ break-up of amount quoted by him for any or all items of Schedule of Prices/ Rates to demonstrate the reasonability.

8.2 Award of Work

8.2.1 Evaluation of Bids and finalisation of Contract/Award of Work shall be on Overall Lowest Quote basis after Commercial & Technical Loading, as applicable.

8.2.2 Entire contract shall be awarded to a single bidder.

8.2.3 The Bidder, whose bid is accepted by Owner, shall be issued Letter of Acceptance (LOA) prior to expiry of bid validity. Bidder shall confirm acceptance by returning a signed copy of the LOA.

8.2.4 Owner shall not be obliged to furnish any information/ clarification/explanation to the unsuccessful bidders as regards non-acceptance of their bids. Except for refund of EMD to unsuccessful bidders, Owner shall correspond only with the successful bidder(s).

8.3 Contract Document

8.3.1 The successful Bidder shall be required to execute a formal Agreement as per the Form of Contract, with Owner within the specified period. For execution of the Agreement, the successful bidder shall provide Stamp Paper of appropriate value. The cost of non-judicial stamp paper shall be borne by the Contractor.

8.3.2 The Contract document shall consist of the following:

- i) Agreement (Form of Contract) signed on non-judicial stamp paper by Owner and Contractor. Format is available in GCC.
- ii) Letter of Acceptance / Purchase Order
- iii) Detailed Letter of Award along with enclosures.
- iv) Bidding Document.
- v) Amendments to Bidding Document, if any.
- vi) Any other documents as deemed necessary.

9.0 CONTRACT PERFORMANCE BANK GUARANTEE

9.1 Refer SCC for details.

10.0 FRAUDULENT PRACTICES

10.1 The OWNER requires that Bidder/Vendor/ Contractor observe the highest standard of

ethics during the award/execution of Contract. "Fraudulent Practice" means a misrepresentation of facts in order to influence the award of a Contract to the detriment of the OWNER, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the OWNER of the benefits of free and open competition.

- 10.2** The OWNER will reject a bid for award if it determines that the bidder recommended for award has engaged in fraudulent practices in competing for the Contract in question.

Bidder is required to furnish the complete and correct information/ documents required for evaluation of their bids, if the information/ documents forming basis of evaluation is found to be false/ forged, the same shall be considered adequate ground for rejection of bids and forfeiture of Earnest Money Deposit.

- 10.3** In case, the information/ document furnished by the Bidder/vendor/Contractor forming basis of evaluation of his bid is found to be false/ forged after the award of the contract, OWNER shall have full right to terminate the contract and get the remaining job executed at the risk & cost of such Bidder/Vendor/ Contractor without any prejudice to other rights available to OWNER under the contract such as forfeiture of CPBG/Security Deposit, withholding of payment etc.

- 10.4** In case, this issue of submission of false document comes to the notice after execution of work, OWNER shall have full right to forfeit any amount due to the Bidder/Vendor/Contractor along with forfeiture of CPBG/Security Deposit furnished by the Bidder/Vendor/Contractor.

- 10.5** Further, such Bidder/Vendor/ Contractor shall be put on Blacklist /Holiday/ Negative List of OWNER debarring them from future business with OWNER for a time period, as per the prevailing policy of OWNER.

11.0 HEALTH, SAFETY, ENERGY AND ENVIRONMENT POLICY

BPCL believes that all the manufacturing and related activities should be conducted in a safe way to ensure the safety of people working in Mumbai Refinery's premises. The contractor shall comply with HSEE Guidelines as per the BPCL's policy and observe safe practices & procedures at work, to protect health and safety of personnel deployed to execute job in Refinery premises. Safety of the contractors' personnel needs enhanced focus by encouraging the awareness amongst them regularly. Statistics of HSEE Guidelines/Policy provides additional benefit to overall effectiveness in the execution of contract work with safety and consciousness.

BPCL is devoted for clearly communicating its HSEE requirements to the contractor and for monitoring the contractor's performance with respect to HSEE. The contractor shall also have its own independent HSEE performance standards in line with the BPCL's HSEE Guidelines and any violation observed by BPCL during currency of the contracts, shall be dealt with strict action against the contractor, including termination of the contract. HSEE Guidelines shall be applicable to all contractors, who work in the premises of BPCL. It may be noted that these guidelines are compilation of certain mandatory requirement for working in premises of BPCL and all contractors shall be liable for strict compliance of all laws, rules and regulations as prescribed by the appropriate state/central governments time to time, in addition to these guidelines.

- 12.0** The "Public Procurement (Preference to Make in India), Order 2017-Revision dated 16.09.2020 including subsequent amendments (if any), issued by Ministry of Commerce and Industry, Department for Promotion of Industry and Internal Trade, Government of India shall be applicable for this tender.

- a. BIDDER SHALL PROVIDE PERCENTAGE OF LOCAL CONTENT IN THE BID, TAKING INTO ACCOUNT THE FACTORS AND CRITERIA LISTED OUT IN THE PPP MII POLICY.
- b. THE BIDDER SHALL SUBMIT AN UNDERTAKING (Annexure-XV attached in Section 2A of Tender) FROM THE AUTHORISED SIGNATORY OF BIDDER HAVING THE POWER OF ATTORNEY ALONG WITH THE BID STATING THE BIDDER MEETS THE

MANDATORY MINIMUM LC REQUIREMENT AND SUCH UNDERTAKING SHALL BECOME A PART OF THE ORDER / CONTRACT.

- c. FOR CONTRACT VALUE MORE THAN INR 10 CRORES, THE BIDDER SHALL SUBMIT AN UNDERTAKING (Annexure-XVI attached in Section 2A of Tender) FROM THE STATUTORY AUDITOR OR COST AUDITOR OF THE COMPANY (IN THE CASE OF COMPANIES) OR FROM A PRACTISING COST ACCOUNTANT OR PRACTISING CHARTERED ACCOUNTANT (IN RESPECT OF SUPPLIERS OTHER THAN COMPANIES) DECLARING MINIMUM LOCAL CONTENT.

The PPP-MII policy is attached with the tender and details can also be referred from Gov. Portal. Latest Guidelines/ Circulars/ Notifications issued by competent authorities shall be applicable.

13.0 PROCUREMENT FROM A BIDDER SHARING LAND BORDER WITH INDIA:

Bidder has to comply with the provisions regarding Procurement from a Country sharing Land Border with India. Contractors shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the competent authority.

Bidders shall submit a certificate of compliance in the format enclosed with the tender document. This certificate shall be on the company's letter head and shall be duly signed & stamped by the authorized signatory of the bidder.

DoE order on public procurement dated 23.02.2023 is attached with the tender and details can also be referred from Gov. Portal. Latest Guidelines/ Circulars/ Notifications issued by competent authorities shall be applicable.



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

LIST OF ANNEXURES

Sr. No.	Annexure No.	Description
1	Annexure-I	Compliance to Bid Requirement
2	Annexure-II	Exceptions and Deviations
3	Annexure-III	Declaration by The Bidder Regarding Bidding Document
4	Annexure-IV	Proforma of Declaration of Holiday Listing
5	Annexure-V	Format of Declaration (Notarial Attested)
6	Annexure-VI	Format for Corporate Guarantee
7A	Annexure-VII	Undertaking by Bidder towards submission of TPIA Verified Documents
7B	Annexure-VII (B)	Format for Undertaking from Bidder for Verification of Bidder's Qualification Criteria Documents of the Tender
8	Annexure-VIII	Format for Undertaking from TPIA for Verification of Bidder's Qualification Criteria (BQC) Documents of the Tender
9	Annexure-IX	Format for Certification by CA for Financial Documents (On Letter Head of CA)
10	Annexure-X	Format for Certification by CA for Financial Documents (On Letter Head of Bidder)
11	Annexure-XI	Proforma for Acknowledgement Letter of Bidding Document
12	Annexure-XII	Proforma of Declaration for Litigation / Arbitration
13	Annexure-XIII	Format for Undertaking With Respect To Compliance Of Restrictions For Countries Which Share Land Border With India– As Stipulated By Govt. Of India
14	Annexure-XIV	Format for Bidder's Queries for Pre Bid-Conference/ Meetings
15	Annexure-XV	Undertaking by Bidder towards Mandatory Minimum LC (Self-Declaration of Local Content By Bidder Under "PPP MII" Policy – to be submitted on their Letter Head)
16	Annexure-XVI	Format for Certificate by Statutory Auditor Or Cost Auditor Or Practicing Cost Accountant Or Chartered Accountant, Towards Mandatory Minimum Local Content
17	Annexure-XVII	Integrity Pact

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-I

COMPLIANCE TO BID REQUIREMENT

NAME OF WORK:

BID REFERENCE No:

NAME OF BIDDER: M/s

We confirm that our bid complies to the total techno-commercial requirement including technical or commercial amendments, if any of Bidding Document without any deviation:

SIGNATURE OF BIDDER: _____

NAME OF BIDDER: _____

COMPANY SEAL: _____

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-II

EXCEPTIONS AND DEVIATIONS

SL.NO	REF OF BID DOCUMENT		SUBJECT	DEVIATIONS
	PAGE NO.	CLAUSE NO		

NOTE: This shall be submitted separately for Commercial & Technical Sections.

SIGNATURE OF BIDDER: _____

NAME OF BIDDER : _____

COMPANY SEAL : _____

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-III

DECLARATION BY THE BIDDER REGARDING BIDDING DOCUMENT

We _____ (Name of the Bidder) hereby represent that we have received/ downloaded and read all Parts/ Volumes of the Bidding Document and have understood the Bidding Documents (including but not limited to) the Commercial & Technical requirements / Specifications in the Bidding Document and that our Bid has been prepared accordingly in compliance with the requirements stipulated in the said documents.

We are submitting the Master Index of Bidding Documents along with the entire Bidding Document and amendments, if any, as part of our Bid duly signed and stamped on each page in token of our acceptance.

We hereby undertake that the said volumes of Bidding Documents Volumes of the Bidding Documents shall be deemed to form part of our bid and in the event of award of work to us, all the parts shall be considered for constitution of Contract Agreement.

Further, we shall sign and stamp each page of these documents as a token of Acceptance and as a part of the Contract in the event of award of Contract to us.

SIGNED FOR AND ON BEHALF OF

(NAME OF BIDDER)

PLACE: _____

DATE: _____

NOTE: This declaration should be signed by the Bidder's representative who is signing the Bid.

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-IV

PROFORMA OF DECLARATION OF HOLIDAY LISTING

(Please submit the following self-declaration on your Company's Letter head, to be signed by the duly authorized person)

Date: _____

Tender No: _____

Title of Tender : _____

To,
Bharat Petroleum Corporation Limited,

Dear Sir / Madam,

I / We Hereby declare that I am / We are currently not serving any Holiday Listing orders issued by Bharat Petroleum Corporation Ltd (BPCL) or Ministry of Petroleum and Natural Gas (MOPNG) debarring me / us from carrying on business dealings with BPCL / MOPNG or convicted of an offence-

- a) Under the prevention of Corruption Act., 1988; or
- b) The Indian Penal Code or any other law for the time being in force, for causing any loss of life or property or causing a threat to public health as part of execution of a public procurement contract.

Further, I/ We declare that the Agency is not or has not become bankrupt, OR is not being dissolved OR has not resolved to be wound up OR no proceedings for winding up or dissolution has been instituted against the Agency;

Signature and Stamp of Bidder :

Authorized Signatory Name :

Bidder Name :

Date:

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-V

FORMAT OF DECLARATION
(NOTARIAL ATTESTED)

To,

BHARAT PETROLEUM CORPORATION LTD.

NAME OF THE BIDDER :

Sub:

Tender No. Dear Sir,

The Bid & Techno Commercial offer no. _____ dated _____ and the Price Bid dated _____ has been submitted by _____ for the subject work.

The undersigned which is the bidder and holding/parent company of the bidder-----, which is our Indian affiliate.

We understand that the bid of _____, has been evaluated taking into account our experience as a group company subject to our giving an undertaking as hereinafter appearing. Now, therefore, in consideration of the premises aforesaid, we undertake so as to bind also our successors and assign that if the Contract is awarded to the Bidder:

- (a) We shall be and remain jointly and severally liable with the Bidder and bound to you for the due and proper performance of the Work as set out in the Scope of Work under the Contract and shall provide the bidder all necessary support including (but not limited to) providing man power, technology, skill, financial resources and expertise available to us to properly perform and complete the Work.
- (b) We jointly and severally shall be and remain bound by this undertaking notwithstanding the existence of any inter-se agreement or dispute between the Bidder and us or between the bidder and you.

We hereby confirm that Mr. _____ the undersigned is authorized and competent to issue this letter/undertaking on our behalf. The authorization letter of each signatory is attached here.

Yours faithfully For

1. Parent/Common holding company
2. Subsidiary of Parent/Common holding company
3. Foreign bidder
4. Indian entity

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-VI

- FORMAT OF "CORPORATE GUARANTEE"

THIS CORPORATE GUARANTEE made on this -----DAY OF----- 200 -- , at ----- (place) by -----(Party's Name), a-----¹ incorporated under the ----- and having its Registered Office² at----- (hereinafter referred to as the "Guarantor" which expression shall unless repugnant to the subject or context deemed to include their successors and assignees) in favour of Bharat Petroleum Corporation Ltd., a public limited company, incorporated under the Companies Act,1913 and having its Registered office ----- (hereinafter referred to as "BPCL" which expression shall unless repugnant to the subject or context, deemed to include their successors and assigns).

WHEREAS BPCL has published Tender No..... for (hereinafter referred to as the "Tender")

WHEREAS Bid & Techno Commercial offer no. _____ dated _ and the Price Bid dated _____ has been submitted by _____ (hereinafter referred to as the "Bidder") pursuant to the Tender.

WHEREAS the Bidder is a subsidiary of the Guarantor and the Guarantor has effective control over the management and affairs of the Bidder. [The Guarantor has also another subsidiary _____ [Name & Detail] and the Guarantor has effective control over its affairs and management as well.]³

WHEREAS the Bidder has requested BPCL to evaluate its bid taking into account the credentials of the Guarantor and / or of _____⁴

WHEREAS in consideration for BPCL agreeing to evaluate the Bidder's bid taking into account the credentials of Guarantor and / or of _____ and to consider the Bidder for the award of the work on that basis, the Guarantor has agreed to provide this Guarantee to BPCL, which will be effective in the event of Bidder's bid being successful and the Bidder being awarded the work pursuant to the Tender.

NOW THEREFORE the Guarantor agrees as follows:

1. The Guarantor does hereby unconditionally guarantee to BPCL the complete and prompt performance by the Bidder of all obligations to be performed (including payment obligations) by the Bidder under the _____⁵ (hereinafter referred to jointly as the "Agreement") as and when required to be performed / paid under the Agreement, in all respects strictly in accordance with the terms, conditions and limitations contained in the Agreement (hereinafter referred to as the "Obligations"). This Guarantee is an absolute, unconditional and continuing guarantee of the full and punctual payment and performance of the Obligations and is in no way conditioned upon any requirement that BPCL first attempt to enforce any of the Obligations against the Bidder, any other guarantor of the Obligations or any other person or entity or resort to any other means of obtaining performance of any of the Obligations. In the event of a default in performance of any of the Obligations by the Bidder, the Guarantor shall promptly perform or cause to be performed such Obligations upon receipt of written notice of such

¹ Nature of the entity to be specified

² Or equivalent thereof

³ In the event of credentials of another subsidiary of the Parent is involved

⁴ Name and Details of the other subsidiary of the Parent

⁵ NOTE TO CLIENT: Specify all document(s) (PO, Contract etc.) which would form the whole Agreement between parties, with reference to the nomenclature in the tender document

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

default / demand of performance from BPCL, without demur and without requiring the BPCL to invoke any legal remedy that may be available to them, it being understood and agreed BPCL shall be the sole judge as to such default in performance.

2. Notwithstanding anything to the contrary, BPCL's decision as to whether the Bidder has made any default of its Obligations and the amount to which BPCL is entitled to by the reason thereof will be binding on the Guarantor and the Guarantor shall not be entitled to ask BPCL to establish their claims under this Guarantee. The Guarantor shall perform the Obligations and / or pay the amounts demanded forthwith, without any objection.
3. This Guarantee is in addition to and not substitution of any other guarantee that may have been executed by the Guarantor in favour of BPCL.
4. The Guarantor hereby unconditionally waives, as a condition precedent to the performance of its obligations hereunder, (a) notice of acceptance hereof, (b) notice of any action taken or omitted to be taken by the BPCL in reliance hereon, (c) any requirement that BPCL be diligent or prompt in making demands hereunder or giving notice to the Guarantor of any default by the Contractor, (d) any requirement that BPCL exhaust any right, power or remedy or proceed against the Bidder under the Agreement or any other agreement or instrument referred to therein, or against any other person under any other guarantee of any of the Obligations, and (e) any event, occurrence or other circumstance which might otherwise constitute a legal or equitable discharge of a surety. Without limiting the generality of the foregoing, it is agreed that the occurrence of any one or more of the following shall not affect the liability of the Guarantor hereunder:
 - (i) at any time or from time to time, without notice to the Guarantor, the time for any performance of or compliance with any of the Obligations shall be extended, or such performance or compliance shall be waived;
 - (ii) any of the acts mentioned in any of the provisions of the Agreement or any other agreement or instrument referred to therein shall be done or omitted; or
 - (ii) any of the Obligations shall be modified, supplemented or amended in any respect in accordance with the terms of the Agreement.
5. This Guarantee shall not be affected by any change in the constitution of or shareholding of either the Guarantor or the Bidder or BPCL or their amalgamations, absorption or merger with any other body corporate and this guarantee will continue to be binding on such new body corporate.
6. The Guarantor hereby agrees that until the payment and satisfaction in full of all Obligations, it shall not exercise any right or remedy arising by reason of the performance of any of its obligations under this Guarantee, whether by subrogation or otherwise, against the Bidder or any other guarantor of any of the Obligations, or any security for any of the Obligations.
7. The Guarantee is irrevocable except with the prior written consent of BPCL
8. The neglect or forbearance of BPCL in enforcing any payment of money or the giving of time by BPCL for the payment thereof shall in no way release the Guarantor from its liability under this deed.
9. The invocation of this Guarantee shall be in writing signed by the authorized signatory of BPCL and all the letters and notices to be given hereunder shall be delivered personally or sent by registered post to the addressee at the addresses hereinabove set out or otherwise advised by and between the parties.

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

10. This Guarantee shall continue in full force and effect until the Bidder or the Guarantor shall have satisfactorily performed or fully discharged all of the Obligations. Further, this Guarantee shall remain in full force and effect without regard to, and shall not be affected or impaired by any invalidity, irregularity or unenforceability in whole or in part of this Guarantee, and shall be discharged only by complete performance of the undertakings herein. This Guarantee shall continue and hold good until it is released by BPCL on the application by the Guarantor after the Bidder / Guarantor has discharged all its Obligations and has obtained a certificate from BPCL of the due completion of the Obligations. Guarantor's obligations and liability arising from this Guarantee shall be no greater than that of the Bidder under the Agreement.
11. This deed of Guarantee and the rights and obligations there under shall be construed and governed by the laws of India for the time being in force. No action, event or condition which, by any applicable law, should operate to discharge the Guarantor from the liability hereunder, shall have any effect. The Guarantor hereby waives any right it may have to apply such law so that in all respects its liability hereunder shall be irrevocable and except as stated herein, be unconditional in all respects.
13. The Guarantor has the power to issue this Guarantee in favor of BPCL under the [Memorandum and Articles of Association] of the Guarantor and the below mentioned signatory on behalf of the Guarantor has been duly authorized by the Guarantor to execute the Guarantee under the duly executed Power of Attorney / Resolution of Board of Directors dated _____, a copy of which is annexed herewith and marked Annexure A.

In witness whereof, the Guarantor has executed this Guarantee on the day and year first hereinabove written

Signature:

Name:

Title:

For and on behalf of the Guarantor

(If the Guarantor is a limited liability company, it is required to get this Guarantee executed under a common seal of the Guarantor backed by proper board resolution. If this Guarantee is executed in India, it should be Notarized. If it is executed abroad, it should be Consularized)

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-VII

**UNDERTAKING BY BIDDER TOWARDS SUBMISSION OF TPIA* VERIFIED DOCUMENTS
(On company letterhead)**

To,

M/s BHARAT PETROLEUM CORPORATION LIMITED

Tender No.:

Tender Title:

Name of Bidder:

Dear Sir,

I / We, M/s (Name of Bidder) have submitted bid for aforesaid tender. We hereby confirm and undertake the following:

- 1) The self-certified copies of certificates / documents related to BQC - Technical & Financial Criteria and MSE certificates, which have been submitted as part of BQC Bid for aforesaid tender, are true copies and as per requirement of the tender.
- 2) In case emerging as successful bidder, I / We shall submit the TPIA* verified copies of required documents mentioned in PQC / certified documents as specified in PQC within 5 (five) days of notification from BPCL, as per requirement of tender.
- 3) I / We understand that, in case I / We are not able to submit TPIA* Verified original documents mentioned in PQC / certified documents as specified in PQC within 5 (five) days of notification from BPCL, I / We shall be holiday listed by BPCL. I / We shall not have any further claims in the bid in such case.

(AUTHORISED
SIGNATORY)

Name of Signatory: Bidder

Name:

(BIDDER'S SEAL/STAMP)

Date:

Place:

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-VII (B)

Format for Undertaking from Bidder
(on Bidders letter head duly stamped & signed)

Subject: Verification of Bidder's qualification Criteria documents of the Tender

Tender Ref. No:

Tender for "....."

All the BQC/techno-commercial documents and credentials have been verified with the originals by TPIA.

It is certified that none of the documents are false/forged or fabricated. All the documents submitted have been made having full knowledge of (i) the provisions of the Indian laws in respect of offences including but not limited to those pertaining to criminal breach of trust, cheating and fraud and (ii) provisions of bidding conditions which entitle the BPCL to initiate action in the event of such declaration turning out to be a misrepresentation or false representation.

I further certify that any additional documents, if any, required to be submitted by our company, shall be submitted under my knowledge and those documents shall also be true, authentic, genuine, exact copy of its original and shall not be false/forged or fabricated.

BPCL reserves the right not to consider our offer on account of non-compliance regarding submission of BQC/techno-commercial related documents duly verified by the TPIA.

(Signature of a person duly authorized to

Sign on behalf of the bidder)

(Seal of the Company)

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-VIII

Format for Undertaking from TPIA
(on TPIA letter head duly stamped & signed)

Ref:.....

Date:.....

To,
Bharat Petroleum Corporation Limited Dear

Sir,

Subject: Verification of Bidder's qualification Criteria (BQC) documents of the Tender

Tender Ref. No:

Tender for "....."
M/s.....with its Registered office at
..... intend to participate in the tender for
..... for BPCL.

The tender conditions provide that the BIDDER shall submit BQC documents duly verified by independent Third Party inspection Agency.

In this regard, this is to certify that copies of all the BQC/techno-commercial related documents submitted to us for verification have been verified by us with the originals and found to be genuine. We have signed and stamped on the copies of all the verified documents.

(Signature of a person duly authorized to Sign on behalf of the TPIA)

(Seal of the Company)

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

**ANNEXURE-IX
(BQC ANNEXURE A)**

(Sample format from CA for Financial documents)
(To be printed on Letter Head of CA)

FINANCIAL DETAILS

We _____ a CA firm having our registered office address _____ and certificate number _____ certify that statutory audit is not mandatory for the company M/s _____, having its registered office at _____ as per prevailing law and we are practicing Chartered Accountant, not being an employee or a Director or not having any interest in the company.

Financial details of the above mentioned Company are as follows: CA to select either of the following options and strike off the other.

- a. In case bidder is a parent company, i.e., having its wholly owned subsidiaries: CA to select either of the following options and strike off the other.
- Financial details are of parent company without the financial data of subsidiaries
 - Financial details are of parent company including the financial data of subsidiaries. It is certified that separate annual report of bidder, without the financial data of subsidiaries, is not prepared and audited.

OR

- b. In case bidder is a subsidiary company: CA to select either of the following options and strike off the other.
- Financial details are of subsidiary company
 - Financial details are of parent company including the financial data of subsidiaries. It is certified that separate annual report of bidder, i.e., subsidiary, is not prepared and audited.

OR

- c. In case bidder does not have any subsidiary or parent company, financial details of are of the company itself.

S No.	Description	Year	Value Currency (___)
1.	Turnover	Latest financial year ()	
		—	
		Preceding 1 st year ()	
		Preceding 2 nd year ()	
2.	Net Worth	Latest financial year ()	(*)

(*) – Indicate Positive or Negative (Value is not Mandatory) Note:

1. In case the financial year closing date is within 6 months of original bid due date and Audited annual report of immediate preceding financial year is not available, Bidder has the option to submit the financial details of the three previous years immediately prior to the last financial year. In case the financial year closing date is within 6 – 9 months of original bid due date and Audited annual report of immediate preceding financial year is not available, Bidder has the option to submit the financial details of the three previous years

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

immediately prior to the last financial year provided Bidder submits a letter from CA stating the reasons of non-preparation/furnishing of the latest year's Audited Financial Statements. In case the financial year closing date is beyond 9 months of original bid due date, it is compulsory to submit the financial details of the immediate three preceding financial years. Example,

In case, audited annual report of immediate preceding financial year (year ending 31st March) is not available and where bid closing date is up to 31st December, the financial details of the three previous years immediately prior to the last financial year may be submitted. However, in case the bid closing date is after 31st December, it is compulsory to submit the financial details of the immediate three preceding financial years only.

2. **Networth calculation:** Networth means paid up share capital, Share Application Money pending allotment* and reserves# less accumulated losses and deferred expenditure to the extent not written off. Networth has been calculated using the following formula, as per provisions of the enquiry document:

Reserves to be considered for the purpose of networth shall be all reserves created out of the profits and securities premium account but shall not include reserves created out of revaluation of assets, write back of depreciation and amalgamation.

*Share Application Money pending allotment will be considered only in respect of share to be allotted.

Paid up share capital	XXXX
Add: Share Application Money pending allotment	XXXX
Add: Reserves (As defined Above)	XXXX
Less: Accumulated Losses	XXXX
Less: Deferred Revenue Expenditure to the extent not written off	XXXX
Networth	XXXX

3. **Turnover:** Turnover shall be considered as per the Statement of Profit and loss. Only revenue from operations shall be considered and other Income shall be excluded. Turnover shall be calculated in the similar manner as above for non – corporate entities.

Signature

Name & Designation

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-X
(BQC ANNEXURE B)

(Sample format for Certification by CA)
(To be printed on Letter Head of Company)

FINANCIAL DETAILS

We, M/s_____, having our registered office at_____certify that statutory audit is not mandatory for the company as per prevailing law and M/s_____, a CA firm having their registered office address_____having certificate number____are practicing Chartered Accountant, not being an employee or a Director or not having any interest in our company.

Financial details of our Company, are as follows: Company to select either of the following options and strike off the other.

- a. In case Bidder is a parent company, i.e., having its wholly owned subsidiaries:

Company to select either of the following options and strike off the other:

- i. Financial details are of parent company without the financial data of subsidiaries
- ii. Financial details are of parent company including the financial data of subsidiaries. It is certified that separate annual report of Bidder, without the financial data of subsidiaries, is not prepared and audited.

OR

- b. In case Bidder is a subsidiary company: Company to select either of the following options and strike off the other.

- i. Financial details are of subsidiary company
- ii. Financial details are of parent company including the financial data of subsidiaries. It is certified that separate annual report of Bidder, i.e., subsidiary, is not prepared and audited.

OR

- c. In case Bidder does not have any subsidiary or parent company, Financial details of are of the company itself.

S no.	Description	Year	Value Currency (___)
1.	Turnover	Latest financial year ()	
		Preceding 1 st year ()	
		Preceding 2 nd year ()	
2.	Net Worth	Latest financial year ()	(*)

(*) – Indicate Positive or Negative (Value is not Mandatory)

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

Note:

1. In case the financial year closing date is within 6 months of original bid due date and Audited annual report of immediate preceding financial year is not available, Bidder has the option to submit the financial details of the three previous years immediately prior to the last financial year. In case the financial year closing date is within 6 – 9 months of original bid due date and Audited annual report of immediate preceding financial year is not available, Bidder has the option to submit the financial details of the three previous years immediately prior to the last financial year provided Bidder submits a letter from CA stating the reasons of non-preparation/furnishing of the latest year's Audited Financial Statements. In case the financial year closing date is beyond 9 months of original bid due date, it is compulsory to submit the financial details of the immediate three preceding financial years. Example, In case, audited annual report of immediate preceding financial year (year ending 31st March) is not available and where bid closing date is up to 31st December, the financial details of the three previous years immediately prior to the last financial year may be submitted. However, in case the bid closing date is after 31st December, it is compulsory to submit the financial details of the immediate three preceding financial years only.

2. **Networth calculation:** Networth means paid up share capital, Share Application Money pending allotment* and reserves# less accumulated losses and deferred expenditure to the extent not written off. Networth has been calculated using the following formula, as per provisions of the enquiry document:

Reserves to be considered for the purpose of networth shall be all reserves created out of the profits and securities premium account but shall not include reserves created out of revaluation of assets, write back of depreciation and amalgamation.

*Share Application Money pending allotment will be considered only in respect of share to be allotted.

Paid up share capital	XXXX
Add: Share Application Money pending allotment	XXXX
Add: Reserves (As defined Above)	XXXX
Less: Accumulated Losses	XXXX
Less: Deferred Revenue Expenditure to the extent not written off	XXXX
Networth	<u>XXXX</u>

3. **Turnover:** Turnover shall be considered as per the Statement of Profit and loss. Only revenue from operations shall be considered and other Income shall be excluded. Turnover shall be calculated in the similar manner as above for non – corporate entities.

**Signature
Name & Designation**

Sign and Stamp of CA (on all pages)

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-XI

PROFORMA FOR ACKNOWLEDGEMENT LETTER OF BIDDING DOCUMENT

To,

**BHARAT PETROLEUM CORPORATION LIMITED,
MUMBAI REFINERY,
MAHUL, MUMBAI, MAHARASHTRA – 400 074, INDIA**

Attention: -

SUB: _____

(BIDDING DOCUMENT NO.: _____)

Dear Sir,

We hereby acknowledge receipt/downloading of a complete set of Bidding Document along with enclosures for subject works as per the Master Index for our use in preparing the Bid.

We undertake that the contents of the above Bidding Document shall be kept confidential and that the drawings, specifications and documents shall not be transferred and further that the said documents are to be used only for the purpose for which they are intended.

We intend to bid as requested for the subject works and furnish following details with respect to our quoting office:

- i. POSTAL ADDRESS : _____

- ii. TELEPHONE NUMBER : _____
- iii. TELEFAX NUMBER : _____
- iv. E-MAIL ADDRESS : _____
- v. CONTACT PERSON : _____

(AUTHORISED SIGNATORY)

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-XII

(Please submit the following self-declaration on your Company's Letter head)

To,

**BHARAT PETROLEUM CORPORATION LIMITED,
MUMBAI REFINERY
MAHUL, MUMBAI, MAHARASHTRA – 400 074, INDIA**

Attention:

SUB: _____

(BIDDING DOCUMENT NO.: _____)

SELF DECLARATION

Bidder's declaration as furnished herein below shall supersede the stipulations mentioned elsewhere in their bid.

SL. NO.	DESCRIPTION	BIDDER'S DECLARATION
1	We confirm that we are not under Liquidation, Court Receivership or similar proceeding, otherwise, if involved please furnish information about the same.	
2a	We confirm that we are not involved in any Litigation/Arbitration	
2b	(In case of Litigation/Arbitration) We confirm that the current Litigation/ Arbitration, in which bidder is involved will not have any impact in work being tendered or in entering contract during the validity of offer and performing the contract till all the contractual obligations under contract are performed.	[To be replied only in case bidder confirms there is any Litigation/Arbitration]
3	We further confirm that the above declaration/confirmation are true and accurate in all respects, and not in conflict with the declaration mentioned in our any part of our bid / financial statement/any other document.	

(AUTHORISED SIGNATORY)

Name of Signatory:

Bidder Name:

Date:

Place:

(BIDDER'S SEAL)

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-XIII

FORMAT for

Undertaking with respect to Compliance of Restrictions for Countries which share land border with India – as stipulated by Govt. of India.

(On Company Letter Head, to be signed by the duly authorized person)

Date:

TENDER NO.:

TITLE OF TENDER:

To,
Bharat Petroleum Corporation Ltd Dear

Sir/Madam,

In line with the guidelines issued for compliance of Restrictions for Countries which share land border with India – as issued by Govt. of India in Feb 2023.

I/We have read the clause regarding restrictions on procurements from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries.

- b. I/We certify that this bidder is not from such a country or if from such a country has been registered with the competent authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered*.
- c. I/We certify that this bidder is not from such a country or if from such a country has been registered with the competent authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the competent authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered*. *(Applicable for works involving possibility of sub-contracting)*
- d. (i) I/We have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement. I certify that this bidder does not have any ToT arrangement requiring registration with the competent authority*. Or

(ii) I/We have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement. I certify that this bidder has valid registration to participate in this procurement*.

I/We hereby certify that I/We fulfill all requirements in this regard and am/are eligible to be considered.

[*Where applicable, evidence of a valid registration by the Competent Authority shall be attached]

Name and Signature of the Authorised Signatory

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-XIV

FOR BIDDER'S QUERIES FOR PRE BID-CONFERENCE/ MEETINGS

SL No	REFERENCE OF BIDDING DOCUMENT				BIDDER'S QUERY	OWNER'S REPLY
	Section	Page No.	Clause No.	Subject		

SIGNATURE OF BIDDER: _____

NAME OF BIDDER: _____

COMPANY SEAL:

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-XV

UNDERTAKING BY BIDDER TOWARDS MANDATORY MINIMUM LC

(Self-Declaration of local content by bidder Under “PPP MII” policy to be submitted on letter head)

To,
M/s BHARAT PETROLEUM CORPORATION LIMITED,

Subject:
Tender No:
Dear Sir,

We, M/s _____ (Name of Bidder) have submitted bid against aforesaid tender.

We have read and understood the Purchase Preference to Make in India Order/Policy attached with the tender document. Accordingly, we hereby confirm that our local content percentage for the tendered item is ____%.

A certificate from Statutory Auditor or Cost Auditor of the Company (in the case of companies) or from a Practicing Cost Accountant or Practicing Chartered Accountant (in respect of suppliers other than company) in this regard has been submitted in technical bid.

Details of the location(s) at which local value addition is made is/are given below:

We confirm that the item(s) offered meets the LC requirement for ‘Class-I local supplier / Class-II local supplier’ as mentioned in the ‘PPP MII Order/Policy’ and the ‘notification(s) published by respective Nodal ministry’ on the website <https://dpiit.gov.in/public-procurements>.

We further confirm that in case M/s _____ < Name of bidder > fall to meet the minimum local content/ domestic value addition, he same shall be treated as false information and Owner reserves the right to take appropriate action for debarment etc. as per provision of the PPP-MII Order, 2017, and as more specifically mentioned in the Bidder/ RFQ document.

Place:
Date:

[Signature of Authorized Signatory
of Bidder having power of attorney]

Name:
Designation:
Seal:

.....
BIDDER'S NAME & SIGNATURE



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

TENDER REF. NO. 1000440719

ANNEXURE-XVI

CRTIFICATE UNDER PPP-MII ORDER, 2017

BY STATUTORY AUDITOR OR COST AUDITOR OR PRACTICING COST ACCOUNTANT OR CHARTERED ACCOUNTANT, TOWARDS MANDATORY MINIMUM LOCAL CONTENT

To
M/s Bharat Petroleum Corporation Limited

NAME OF WORK / ITEM:

TENDER / RFQ NO.:

Dear Sir,

We, _____, the Statutory Auditor or Cost Auditor of the company (in case of companies) or are a practicing Cost Accountant or practicing Chartered Accountant (in respect of supplier other than companies) of M/s ____<Name of Bidder> hereby certify that as per definition specified in above policy, M/s <Name of Bidder> is a Class-I local Supplier/ Class-II local supplier<as applicable>

We further confirm that M/s _____<Name of Bidder> meet the Mandatory Minimum Local content requirement specified for Class-I Local Supplier / Class-II Local supplier <as applicable> under Policy for Public procurement (Preference to Make in India), Order 2017 (PPP-MII) for their offer for the abovementioned Work/ Item and has/ shall have Local Content of _____%.

The detail of the Location(s) at which the Local value addition is/ shall be made, is/ are as under:

We further confirm that in case M/s _____< Name of bidder> fall to meet the minimum local content/ domestic value addition, he same shall be treated as false information and Owner reserves the right to take appropriate action for debarment etc. as per provision of the PPP-MII Order, 2017, and as more specifically mentioned in the Bidder/ RFQ document.

Place:
Date:
Name of Audit Firm Designation
Seal:

Signature of certification issuing authority
Name:

.....
BIDDER'S NAME & SIGNATURE



**EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC
CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT
MUMBAI REFINERY.**

ANNEXURE-XVII

INTEGRITY PACT

Between

Bharat Petroleum Corporation Limited (BPCL) hereinafter referred to as "The Principal",

And

..... hereinafter referred to as "The Bidder/
Contractor/ Supplier".

Preamble

The Principal intends to award, under laid down organization procedures, contract/s for Tender for

..... The Principal values full compliance with all relevant laws and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder/s, Contractor/s, and Supplier/s.

In order to achieve these goals, the Principal cooperates with the renowned international Non-Governmental Organization "Transparency International" (TI). Following TI's national and international experience, the Principal will appoint an Independent External Monitor who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 - Commitments of the Principal

- (1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:
 - a) No employee of the Principal, personally or through family members, will in connection with the tender, or the execution of the contract, demand, take a promise for or accept, for himself/ herself or third person, any material or immaterial benefit which he/she is not legally entitled to.
 - b) The Principal will, during the tender process, treat all Bidders with equity and reason. The Principal will, in particular, before and during the tender process, provide to all Bidders the same information and will not provide to any Bidder confidential/ additional information through which the Bidder could obtain an advantage in relation to the tender process or the contract execution.
 - c) The Principal will exclude from the process all known prejudiced persons.
- (2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the relevant Anti-Corruption Laws of India, or if there be a substantive suspicion



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder/ Contractor/ Supplier

- (1) The Bidder/ Contractor/ Supplier commits itself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
- a) The Bidder/ Contractor/ Supplier will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person, any material or immaterial benefit which he/she is not legally entitled to, in order to obtain in exchange, any advantage of any kind whatsoever during the tender process or during the execution of the contract.
 - b) The Bidder/ Contractor/ Supplier will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
 - c) The Bidder/ Contractor/ Supplier will not commit any offence under the relevant Anti-Corruption Laws of India; further the Bidder/ Contractor/ Supplier will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
 - d) The Bidder/ Contractor/ Supplier will, when presenting his bid, disclose any and all payments he has made, is committed to, or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
 - e) The Bidder/ Contractor/ Supplier shall make sure that the terms of this Integrity Pact are also adopted by its sub-contractors, sub-sub-contractors etc, if any and submit such adoption confirmation proof to the Principal.
- (2) The Bidder/ Contractor/ Supplier will not instigate third persons to commit offences outlined above or be an accessory to such offences.



**EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC
CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT
MUMBAI REFINERY.**

Section 3 - Disqualification from Tender Process and Exclusion from Future Contracts

If the Bidder, before contract award, has committed a transgression through a violation of Section 2 or in any other form such as to put his reliability or credibility as Bidder into question, the Principal is entitled to disqualify the Bidder from the tender process or to terminate the contract, if already signed, for such reason.

- (1) If the Bidder/ Contractor/ Supplier has committed a transgression through a violation of Section 2 such as to put his reliability or credibility into question, the Principal is also entitled to exclude the Bidder/ Contractor/ Supplier from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, in particular the number of transgressions, the position of the transgressors within the company hierarchy of the Bidder and the amount of the damage. The exclusion will be imposed for a minimum of 6 months and maximum of 3 years.
- (2) A transgression is considered to have occurred if the Principal after due consideration of the available evidences, concludes that no reasonable doubt is possible.
- (3) The Bidder accepts and undertakes to respect and uphold the Principal's absolute right to resort to and impose such exclusion and further accepts and undertakes not to challenge or question such exclusion on any ground, including the lack of any hearing before the decision to resort to such exclusion is taken. This undertaking is given freely and after obtaining independent legal advice.
- (4) If the Bidder/ Contractor/ Supplier can prove that he has restored/ recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal may revoke the exclusion prematurely.

Section 4 - Compensation for Damages

- (1) If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover from the Bidder liquidated damages equivalent to Earnest Money Deposit/Bid Security.
- (2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor/ Supplier liquidated damages equivalent to Security Deposit/ Performance Bank Guarantee.
- (3) The Bidder agrees and undertakes to pay the said amounts without protest or demur subject only to condition that if the Bidder/ Contractor/ Supplier can prove and establish that the exclusion of the Bidder from the tender process or the termination of the contract after the contract award has caused no damage or less damage than the amount of the liquidated damages, the Bidder/ Contractor/ Supplier shall compensate the Principal only to the extent of the damage in the amount proved.

SB

**EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC
CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT
MUMBAI REFINERY.**

Section 5 - Previous Transgression

- (1) The Bidder declares that no previous transgression occurred in the last 3 years with any other Company in any country conforming to the TI approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- (2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 - Equal treatment of all Bidders/ Contractors/ Suppliers/ Subcontractors

- (1) The Bidder/ Contractor/ Supplier undertakes to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.
- (2) The Principal will enter into agreements with identical conditions as this one with all Bidders, Contractors/ Suppliers and Subcontractors.
- (3) The Principal will disqualify from the tender process all Bidders who do not sign this Pact or violate its provisions.

Section 7 - Punitive Action Against Violating Bidders/ Contractors/ Suppliers/ Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor, Supplier or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor, Supplier or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 - Independent External Monitors

- (1) The Principal has appointed competent and credible Independent External Monitors for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
- (2) The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Chairperson of the Board of the Principal.
- (3) The Bidder/ Contractor/ Supplier accepts that the Monitor has the right to access without

S/S



EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT MUMBAI REFINERY.

- restriction to all Project documentation of the Principal including that provided by the Bidder/ Contractor/ Supplier. The Bidder/ Contractor/ Supplier will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to this project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder/ Contractor/ Supplier/ Subcontractor with confidentiality.
- (4) The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Bidder/ Contractor/ Supplier. The parties offer to the Monitor the option to participate in such meetings.
- (5) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or heal the violation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendation. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action. However, the Independent External Monitor shall give an opportunity to the Bidder/ Contractor/ Supplier to present its case before making its recommendations to the Principal.
- (6) The Monitor will submit a written report to the Chairperson of the Board of the Principal within 8 to 10 weeks from the date of reference or intimation to him by the 'Principal' and, should the occasion arise, submit proposals for correcting problematic situations.
- (7) If the Monitor has reported to the Chairperson of the Board a substantiated suspicion of an offence under relevant Anti-Corruption Laws of India, and the Chairperson has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- (8) The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

This Pact begins when both parties have legally signed it. It expires for the Contractor/ Supplier 12 months after the last payment under the respective contract, and for all other Bidders 6 months after the contract has been awarded.



**EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC
CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT
MUMBAI REFINERY.**

If any claim is made/ lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by Chairperson of the Principal.

Section 10 - Other Provisions

- (1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the Registered Office of the Principal, i.e. Mumbai. The Arbitration clause provided in the main tender document/ contract shall not be applicable for any issue/ dispute arising under Integrity Pact.
- (2) Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- (3) If the Bidder/ Contractor/ Supplier is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- (4) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- (5) If any Bidder/ Contractor/ Supplier entering into Integrity Pact, aggrieved by any decision / action of the Principal, shall approach the IEMs and await their decision before pursuing any other remedy available to him in law.


.....
(S.A. Basu)
For the Principal

.....
For the Bidder/ Contractor/
Supplier

Place

Witness 1 :
(Signature/Name/Address)

Date

Witness 2 :
(Signature/Name/Address)

STANDARD FORMS

Form No.	Particulars
Form 1	Bid Information Form
Form 2	Bank Guarantee Format (For Earnest Money Deposit / Security Deposit Towards Performance)
Form 3	Proforma of Insurance Surety Bond towards Bid Security (EMD) / Performance Security
Form 4	Format For CA certification for MSE
Form 5	Checklist for BQC Submission
Form 6	Past Experience in support of BQC
Form 7	Bidder Document Checklist Form
Form 8	GCC Acknowledgement Form
Form 9	Performance Bank Guarantee Format
Form 10	Vendor Code Creation Form

FORM 1

BID INFORMATION FORM

Bid Information Form

Tender Title :

Tender No.:

S.No.	Particulars	Bidders Response
1	Company Name	
2	Contact Person Name	
3	Contact Details	
	Telephone No.:	
	Mobile no.:	
	Email ID:	
	Registered Office Address:	
	Operating/ Working Location Address:	
4	Offer Reference No.	
5	Offer validity from final bid due date (180 days)	
6	Firm prices quoted till completion of the contract period	
7	All SOR items quoted in the price bid	
8	Not Quoted "zero" or left any item blank in price bid	
9	Type of Company (Public Ltd. /Pvt. Ltd./ Proprietorship/ HUF/ Private/ Partnership /LLC etc.)	
10	PAN No.	
11	Are you registered with NSIC / MSE (Yes/No). If Yes, attach relevant certificates.	
12	If MSE, then specify category (Micro / Small) and Registration No.	
13	GST Registration Type (Unregistered/Registered/Composite/SEZ)	
14	GST Registration No.	
15	Billing State	
16	Applicable GST rate for this tender	
17	HSN/SAC No.	
18	Acceptance of Tender Document and Annexures	(Yes/No)
	1) IFB and ITB	
	2) Scope of Work	
	3) Payment Terms	
	4) General Conditions of Contract (GCC)	
	5) SCC	
	6) Special Safety Conditions.	
	7) Financial Deterrent for violation of Safety norms by Bidders.	
	8) Memorandum of Agreement	
	9) Scope of Work	
	10) General Terms and Conditions.	
	11) IMS Policy	
	12) Policy for Holiday Listing of Vendors in BPCL - This shall supersede GCC condition.	

S.No.	Particulars	Bidders Response
	13) Restrictions for Countries which shares Land Border with India under Rule 144(xi) of GFR 2017	
	14) PPP-MII Policy (As applicable)	
	15) Integrity Pact (As applicable)	

Signature and Stamp of Bidder :

Authorized Signatory Name :

Bidder Name :

Date:

FORM 2

PROFORMA OF BANK GUARANTEE

(FOR EMD / SECURITY DEPOSIT TOWARDS PERFORMANCE)

PROFORMA OF BANK GUARANTEE
(On non-judicial paper of appropriate value)
FOR EARNEST MONEY / SECURITY DEPOSIT TOWARDS PERFORMANCE

To
Bharat Petroleum Corporation Ltd.

Dear Sirs,

M/s. _____ have taken tender for the work __CRFQ No/PO No. _____ for Bharat Petroleum Corporation Ltd.

The tender Conditions of Contract provide that the Contractor shall pay a sum of Rs. _____ (Rupees _____) as earnest money/security deposit in the form therein mentioned. The form of payment of earnest money/security deposit includes guarantee executed by Scheduled Bank, undertaking full responsibility to indemnify Bharat Petroleum Corporation Ltd. in case of default.

The said _____ have approached us and at their request and in consideration of the premises we _____ having our office at _____ have agreed to give such guarantee as hereinafter mentioned.

1. We _____ hereby undertake and agree with you that if default shall be made by M/s. _____ in performing any of the terms and conditions of the tender or in payment of any money payable to Bharat Petroleum Corporation Ltd. We shall on demand pay to you in such matter as to you may direct the said amount of Rupees _____ only or such portion thereof not exceeding the said sum as you may from time to time require.
2. You will have the full liberty without reference to us and without effecting this guarantee postpones for any time or from time to time the exercise of any of the powers and rights conferred on you under the contract with the said _____ and to enforce or to for bear from endorsing any power of rights or by reason of time being given to the said which under law relating to the sureties would but for provision have the effect of releasing us.
3. Your right to recover the said sum of Rs. _____ (Rupees _____) from us in manner aforesaid will not be affected or suspended by reason of the fact that any dispute or disputes have been raised by the said M/s. _____ and/or that any dispute or disputes are pending before any officer, tribunal or court.
4. The guarantee herein contained shall not be determined or affected by the liquidation or winding up, dissolution or change of constitution or insolvency of the said _____ but shall in all respects and for all purposes be binding operative units payment of all money due to you in respect of such liabilities is paid.
5. Our liability under this guarantee is restricted to Rupees _____. Our guarantees shall remain in force until _____ unless a suit or action to enforce a claim under _____ Guarantee is filed against us within six months from _____ (which is date of expiry of guarantee) all our rights under the said guarantee shall be forfeited and shall be relieved and discharged from all liabilities thereunder.
6. We have power to issue this guarantee in your favour under Memorandum and Articles of Association and the undersigned has full power to do under the Power of Attorney dated _____ granted to him by the Bank.

Yours faithfully

_____ Bank by its Constituted Attorney Signature of a person duly authorized to sign on behalf of the bank.

FORM 3

PROFORMA OF INSURANCE SURETY BOND TOWARDS BID
SECURITY (EMD) / PERFORMANCE SECURITY

Proforma of Insurance Surety Bond towards Bid Security (EMD) / Performance Security

[To be stamped in accordance with Stamp Act of India]

Insurance Surety Bond No.

Date

To

Bharat Petroleum Corporation Ltd.

Dear Sirs,

In accordance with Invitation for Bids under your Tender No. & date....., M/s.....[Bidder's Name].....

having its Registered / Head Office at..... (hereinafter called the 'Bidder') wish to participate / have been

awarded [as the case may be] in the said tender for [Procurement description / Tender Title].

As an irrevocable Insurance Surety Bond against Bid Security (EMD) / Performance Security [as the case may be] for an amount of

..... [EMD / Performance Security amount] and remain in full force for a period of (days) i.e. up to [Validity Date]

from the Bid Due Date and with an additional claim period of.... (days) i.e. up to [Claim Period Validity Date] required to be submitted

by the Bidder as a condition precedent for participation in the said bid / award of contract [as the case may be] which amount is liable to be forfeited on the happening of any contingencies as mentioned under the Bidding Documents / Contract / LoA.

We, the [Name of the Insurer] registered under IRDAI having our Head Office at[Address of the Insurer]

guarantee and undertake to pay immediately on demand by Bharat Petroleum Corporation Limited (hereinafter called the 'Beneficiary') the amount of [EMD / Performance Security amount] without any reservation, protest, demand and recourse. Any such demand made

by the Beneficiary shall be conclusive and binding on us irrespective of any dispute or difference raised by the Bidder and / or any right / remedy available to the bidder in terms thereof.

This Insurance Surety Bond shall be unconditional as well as irrevocable and shall remain valid up to [Claim date]. If any further extension of this Insurance Surety Bond is required, the same shall be extended to such required period on receiving instructions from M/s

..... [Bidder's Name] on whose behalf this Insurance Surety Bond is issued.

The Insurer declares that it has power to issue this Surety Bond and discharge the obligations contemplated herein, the undersigned is duly authorised and has full power to execute this Surety Bond for and on behalf of the Insurer.

The Surety Bond shall not be affected by any change in the constitution or winding up of the Bidder or the Insurer or any absorption, merger or amalgamation of the Bidder or the Insurer with any other person.

In witness where of the Insurer, through its authorised officer, has set its hand and stamp on this.....day of.....20.....at.....

.....
(Signature)

.....
(Name)

.....
(Designation with Insurer Stamp)

Contact Details & Address of Surety Insurer for verification:

Name (Official):

Branch

Address:.....

Telephone

Mobile No:.....

E-mail:.....

Date:.....

FORM 4
FORMAT FOR CA CERTIFICATION FOR MSE
(ON CA'S LETTERHEAD WITH UDIN)

Date: _____

**CERTIFICATE CONFIRMING ELIGIBILITY FOR BENEFITS OF PUBLIC PROCUREMENT POLICY AS
PER MSMED ACT 2006**

Ref: Tender/Bid No..... for.....

This is to confirm that we have verified the investment limits, turnover and other details of M/s _____ and certify that they satisfy the eligibility criteria as per MSMED Act, 2006 and other notifications/circulars/amendments issued time to time in this regard. Accordingly, M/s ____ is a Micro/Small enterprise (*kindly tick in appropriate box*) under the said Act and are eligible to claim the benefits of public procurement policy as per MSMED Act 2006 and Public Procurement Policy Order 2012 and their revisions for the tender mentioned above.

Micro enterprise -

☐

Small enterprise -

☐

In case applicable:

Based on our verification of share holding pattern and other details, it is certified that M/s _ meets the eligibility criteria under SC/ST provision of Public Procurement Policy Order 2012 and other notifications/circulars issued time to time in this regard and are hence eligible to claim benefits pertaining to SC/ST under the Public Procurement Policy Order 2012 and its revision.

In case applicable:

Based on our verification of share holding pattern and other details, it is certified that M/s _ meets the eligibility criteria under Women Entrepreneur provision of Public Procurement Policy Order 2012 and other notifications/circulars issued time to time in this regard and are hence eligible to claim benefits pertaining to Women Entrepreneur under the Public Procurement Policy Order 2012 and its revision.

Charter Accountant

Name/Firm Name:

Signature and Stamp:

Membership No:

FORM 5

CHECKLIST FOR BQC SUBMISSION

CHECKLIST FOR BQC SUBMISSION

Tender Title :

Tender No.:

The following documents shall be uploaded by the bidder duly filled, signed, stamped as applicable.

Bid Document	Required for Bid Submission	Bidder Response-Submitted (Yes/ No)
1) Techno-Commercial Criteria	Yes	
a) Past Experience in support of BQC as per format provided.	Yes	
b) Purchase Order Copies.	Yes	
c) Schedule of Rates.	Yes	
d) Completion Certificate of Job.	Yes	
e) Final Certified Bills.	Yes	
f) Any other relevant documents, if required, to substantiate the executed value of Similar Work and to establish the Similar Work as defined in Tender , co-relating the work order and/or Completion certificate, including but not limited to the certificate from Owner/End User/PMC, certified copy of invoice/final bill, SOR, Payment Terms etc.(as applicable)	As Applicable	
g) Any other documents for meeting the BQC criteria or as specified in Tender.	As Applicable	
2) Financial Criteria	Yes	
a) Audited Balance Sheets for the period mentioned.	Yes	
b) Certificate from the Chartered Accountant/ Cost Accountant indicating the turnover details, balance sheet as applicable.	Yes	
c) Unique Document Identification Number (UDIN) of the CA, without which these Certificates/ reports shall not be considered for evaluation.	Yes	
d) Any other documents for meeting the BQC criteria or as specified in Tender.	As Applicable	
3) Authentication of Documents	Yes	
a) Bidder Undertaking to submit TPIA Certificate (as per Format) giving assurance to submit TPIA verified documents in case they are the successful bidder. Refusal to submit undertaking as per the given format by bidder shall be considered as one of rejection criteria for bid evaluation.	Yes	
b) Once the price bids are opened, the successful bidder shall be notified to submit TPIA verified documents within 5 days' time along with undertaking from bidder and TPIA undertaking as per given Annexures/Forms. If the successful bidder fails to submit TPIA documents, then necessary action shall be initiated against the bidder as per guidelines.	Yes	

Signature and Stamp of Bidder:

Authorized Signatory Name :

Bidder Name:

Date:

FORM 6

PAST EXPERIENCE IN SUPPORT OF BQC

PAST EXPERIENCE IN SUPPORT OF BQC
(AS CALLED FOR IN "BIDDER QUALIFICATION CRITERIA")

TENDER TITLE:
TENDER NO.:

SL.NO.	CONTRACT NO.WITH DATE	DESCRIPTION OF WORK	CLIENT NAME, CONTACT DETAILS& NAMEOF OFFICER IN CHARGE	CONTRACT VALUE	STARTING DATE	SCHEDULED COMPLETION DATE	ACTUAL COMPLETION DATE	ACTUAL COMPLETED VALUE	REASONS FORDELAY, IF ANY	WHETHER WORKS EXECUTED AS MAIN CONTRAC TOR OR AS SUB- CONTRACT OR

Note: Copies of work order(s) and completion certificate(s) for above jobs should be submitted by the Bidder along with this Form.

Signature and Stamp of Bidder:

Authorized Signatory Name:

Bidder Name :

Date:

FORM 7
BIDDER DOCUMENT CHECKLIST

BIDDER DOCUMENT CHECKLIST

Sr No	DOCUMENTS TO BE UPLOADED BY BIDDERS	SUBMITTED		
		☐ Yes	☐ No	☐ NA
1	PROOF OF EMD - SUBMISSION / EXEMPTION	☐ Yes	☐ No	☐ NA
2	TECHNICAL BID QUALIFICATION CRITERIA DOCUMENTS	☐ Yes	☐ No	☐ NA
3	FINANCIAL BID QUALIFICATION CRITERIA DOCUMENTS	☐ Yes	☐ No	☐ NA
4	SIGNED COPY OF GCC/GPC/SPC	☐ Yes	☐ No	☐ NA
5	GCC/GPC ACKNOWLEDGEMENT FORM	☐ Yes	☐ No	☐ NA
6	SIGNED COPY OF SCOPE OF WORK	☐ Yes	☐ No	☐ NA
7	ORGANIZATIONAL DETAILS FORM	☐ Yes	☐ No	☐ NA
8	ANNEXURE 1 TO 3 VERIFICATION OF BQC DOCUMENTS (UNDERTAKING OF BIDDER)	☐ Yes	☐ No	☐ NA
9	TECHNICAL DEVIATION FORMAT	☐ Yes	☐ No	☐ NA
10	COMMERCIAL DEVIATION FORMAT	☐ Yes	☐ No	☐ NA
11	DECLARATION OF COMPLIANCE TO BID REQUIREMENT	☐ Yes	☐ No	☐ NA
12	TENDER ACKNOWLEDGEMENT FORM	☐ Yes	☐ No	☐ NA
13	CA CERTIFICATE & UDYAM REGISTRATION CERTIFICATE – IN CASE OF MSE BIDDER	☐ Yes	☐ No	☐ NA
14	DECLARATION OF HOLIDAY LISTING STATUS	☐ Yes	☐ No	☐ NA
15	DECLARATION / UNDERTAKING FOR AVAILING PURCHASE PREFERENCE UNDER PPP-MII	☐ Yes	☐ No	☐ NA
16	SIGNED COPY OF DMI&SP POLICY	☐ Yes	☐ No	☐ NA
17	UNDERTAKING FROM CONTRACTOR REGARDING CONTRACT LABOUR ENGAGEMENT - AGE LIMIT	☐ Yes	☐ No	☐ NA
18	LAND BORDER UNDERTAKING FORMAT	☐ Yes	☐ No	☐ NA
19	INTEGRITY PACT	☐ Yes	☐ No	☐ NA
20	SAFETY COMPETENCY FORM	☐ Yes	☐ No	☐ NA

NAME OF BIDDER : _____

SIGNATURE OF BIDDER: _____

DATE: _____

COMPANY SEAL : _____

FORM 8
GCC ACKNOWLEDGEMENT FORM

ACKNOWLEDGEMENT

We, M/s. _____ having office at _____
received the copy of GENERAL CONDITIONS OF CONTRACT and confirm our acceptance to
all the terms and conditions as mentioned herein in this General Conditions of Contract and we are
hereby returning this copy of Acknowledgement duly signed.

For & on behalf of M/s. _____

Signature :

Name : _____

Designation : _____

(Seal / Stamp)

Place :

Date :

FORM 9
PERFORMANCE BANK GUARANTEE FORMAT
AND LIST OF BANKS FOR BG ACCEPTANCE

PERFORMANCE BANK GUARANTEE
(On Non-judicial paper for appropriate value)

To,
Bharat Petroleum Corporation Limited

Dear Sir,

In consideration of the Bharat Petroleum Corporation Limited, (hereinafter called 'the Company' which expression shall include its successors and assigns) having awarded to M/s. (Name)(Constitution)(address)

... (hereinafter referred to as "The vendor" which expression shall wherever the subject or context so permits include its successors and assigns) a supply contract in terms interalia, of the Company's Purchase order No..... dated and the General and Special Purchase Conditions of the Company and upon the condition of vendor's furnishing security for the performance of the vendor's obligations and/or discharge of the vendor's liability under and / or in connection with the said supply contract upto a sum of Rs. (in figures).....Rs (in words) only amounting to 5% (five percent) of the total contract value.

We, (Name).....(constitution)(hereinafter called "the Bank" which expression shall include its successors and assigns) hereby jointly and severally undertake and guarantee to pay to the Company in -- --- (Currency) forthwith on demand in writing and without protest or demur of any and all moneys any wise payable by the Vendor to the Company under in respect of or in connection with the said supply contract inclusive of all the Company's losses and expenses and other moneys anywise payable in respect to the above as specified in any notice of demand made by the Company to the Bank with reference to this Guarantee upto an aggregate limit of Rs(in figures).....Rs(in words) only.

AND the Bank hereby agrees with the Company that

- (i) This Guarantee/undertaking shall be a continuing guarantee and shall remain valid and irrevocable for all claims of the Company and liabilities of the vendor arising upto and until midnight of

This date shall be 6 months from the last date of guarantee period.

- (ii) This Guarantee/ Undertaking shall be in addition to any other guarantee or security of whatsoever that the Company may now or at any time otherwise have in relation to the vendor's obligation/liabilities under and /or connection with the said supply contract, and the Company shall have full authority to take recourse to or reinforce this security in preference to the other security(ies) at its sole discretion, and no failure on the part of the Company in enforcing or requiring enforcement of any other security shall have the effect of releasing the Bank from its liability hereunder.
- (iii) The Company shall be at liability without reference to the Bank and without effecting the full liability of the Bank hereunder to take any other security in respect of the vendor's obligations and /or liabilities under or in connection with the said supply contract and to vary the terms vis a vis the vendor of the said supply contract or to grant time and/ or indulgence to the vendor or to reduce or to increase or otherwise vary the prices of the total contract value or to release or to forbear from enforcement all or any of the obligations of the vendor under the said supply contract and/ or the remedies of the Company under any other security(ies) now or hereafter held by the Company and no such dealing(s), variation(s), reduction(s), increase(s) or the indulgence(s) or arrangement(s) with the vendor or release or forbearance whatsoever shall have the effect of releasing the Bank from its full liability to the Company hereunder or of prejudicing rights of the Company against the Bank.

- (iv) This Guarantee /Undertaking shall not be determined by the liquidation or winding up or dissolution or change of constitution or insolvency of the vendor but shall in all respects and for all purposes be binding and operative until payment of all moneys payable to the Company in terms hereof.
- (v) The Bank hereby waives all rights at any time inconsistent with the terms of the Guarantee/ Undertaking and the obligations of the Bank in terms hereof shall not be anywhere affected or suspended by reason of any dispute or disputes having been raised by the vendor (whether or not pending before any Arbitrator, officer, Tribunal or Court) or any denial of liability by the vendor or any other order of communication whatsoever by the vendor stopping or preventing or purporting to stop or prevent any payment by the Bank to the Company in terms hereof.
- (vi) The amount stated in any notice of demand addressed by the Company to the Guarantor as liable to be paid to the Company by the vendor or as suffered or incurred by the Company on account of any losses or damages of costs, charges and or expenses shall as between the Bank and the Company be conclusive of the amount so liable to be paid to the Company or suffered or incurred by the Company, as the case may be and payable by the Guarantor to Company in terms hereof.

Yours faithfully,

(Signature)

NAME & DESIGNATION

NAME OF THE BANK

NOTES:

List of banks for BG acceptance

Sr No.	Name of Bank	Category of Banks
1	AU Small Finance Bank Ltd	Indian Bank
2	Axis Bank Ltd	Indian Bank
3	Bank of Baroda	Indian Bank
4	Bank of India	Indian Bank
5	Bank of Maharashtra	Indian Bank
6	Canara Bank	Indian Bank
7	Federal Bank Ltd	Indian Bank
8	HDFC Bank Ltd .	Indian Bank
9	ICICI Bank Ltd	Indian Bank
10	IDFC First Bank Ltd	Indian Bank
11	Indian Bank	Indian Bank
12	IndusInd Bank Ltd	Indian Bank
13	Kotak Mahindra Bank Ltd	Indian Bank
14	Punjab National Bank	Indian Bank
15	State Bank of India	Indian Bank
16	Union Bank of India Ltd	Indian Bank
17	Abu Dhabi Commercial Bank PJSC	Foreign Bank
18	Bank of America NA	Foreign Bank
19	Bank of Nova Scotia/The	Foreign Bank
20	BNP Paribas SA	Foreign Bank
21	Shinhan Financial Group Co Ltd	Foreign Bank
22	Citibank NA	Foreign Bank
23	DBS Group Holdings Ltd	Foreign Bank
24	Hongkong & Shanghai Banking Co	Foreign Bank
25	Westpac Banking Corp	Foreign Bank
26	Industrial & Commercial Banko	Foreign Bank
27	Credit Agricole SA	Foreign Bank
28	Cooperatieve Rabobank UA	Foreign Bank
29	Doha Bank QPSC	Foreign Bank
30	Qatar National Bank QPSC	Foreign Bank
31	United Overseas Bank Ltd	Foreign Bank
32	Hana Bank	Foreign Bank
33	Industrial Bank of Korea	Foreign Bank
34	First Abu Dhabi Bank PJSC	Foreign Bank
35	Emirates NBD Bank PJSC	Foreign Bank
36	NatWest Markets PLC	Foreign Bank
37	Bank of China Ltd	Foreign Bank
38	CTBC Bank Co Ltd	Foreign Bank

FORM 10
VENDOR CODE CREATION FORM

VENDOR CODE IN BPCL:

(A) If bidder already has vendor code in BPCL

- kindly mention the **VENDOR CODE** in your offer which can be used for EMD accounting.

(B) If bidder is not registered in BPCL:

- For bidders who don't have their vendor code in BPCL, it is mandatory to submit signed and stamped scan copies of following vendor template (BPCL VENDOR MASTER - VENDOR CODE CREATION/ UPDATION FORM) along with following documents so that their vendor code can be created.
 - Pan card copy
 - GST certificate
 - Incorporation certificate.... (in case of Pvt Ltd and Public sector)
 - Partnership deed.... (if Type of Company is Partnership Firm)
 - Cancelled cheque or Bank statement.
 - MSE Udyam certificate.....(if MSE vendor).

Kindly submit duly filled, signed & stamped copy of following **VENDOR TEMPLATE (BPCL VENDOR MASTER - VENDOR CODE CREATION/ UPDATION FORM)** for creation of your vendor code in BPCL SAP system.

BPCL VENDOR MASTER - VENDOR CODE CREATION/ UPDATION FORM

**SEC
1.0**

ORGANIZATION AND TAX RELATED DETAILS

Sr. No	Description	Vendor Response																Remarks		
1	Type of Company (Nature of Entity or Business Concern (Please tick the appropriate Value)	01 Individual								02 HUF								1.Pl tick wherever applicable. 2. Pls. attach self-attested and stamped copy of relevant Registration Certificate/Partnership/Trust Deed/lease deed 3. For foreign vendors, details mentioned in Sl. no.6 is optional and Sl.no. 7 to 11 are not applicable.		
		03 Association of Persons (AOP)								04 Body of Individuals (BOI)										
		05 Co-op. Society								06 Trust										
		07 Partnership Firm								08 Sole Proprietorship Firm										
		09 Public Ltd. Company								10 Private Ltd. Company										
		11 Central PSU								12 State PSU										
		13 Central Govt. Authority/Department								14 State Govt. Authority/Department										
		15 Limited Liability Partnership (LLP)								16 Foreign Vendor										
		17 Others, pl Specify:																		
2	E-mail ID																	Pls. indicate e-mail Id to be used by us for sending updates, information, etc.		
	E-mail ID (alternate)																			
3	Mobile No.	+	9	1	-												Pls. indicate mobile No to be used by us for sending updates, information			
	Mobile No. (alternate)	+	9	1	-															
4	Telephone No.	STD								Landline								Pls. indicate STD code followed by Telephone No.		
5	Communication Address as per GST registration address	Building																Pls provide address details		
		Street																		
		Village/City								District/Taluka/Zilla										
		State								PIN										
6	PAN Number																Please attach self-attested Copy of Pan Card			
7	GST Registered Status	Registered								Unregistered								Composition		Pl tick wherever applicable.
8	GST Regn No. / Composition Registration No.																	Please attach the self-attested registration Certificate		
9	Whether unit for which GST no. is	YES								NO								Pl tick wherever applicable.		

	provided is located in SEZ						
10	Whether having multiple GST registration in a state	YES		if Yes, Business Division		NO	<i>Pl tick wherever applicable. If Yes, specify business Division</i>
11	Whether registered under MSME	YES		NO			<i>Pl tick wherever applicable.</i>
	MSME Category	MSME Women (Yes/ No)		SC/ST MSME (Yes/ No)			
I/We confirm that all the information provided above is correct and belongs to my organization/ business.							
(Vendor Name)		(Vendor Code in BPCL) [applicable in case details to be updated for existing vendor code]		(Name & Signature of Authorized Signatory)		(Company Seal)	
Date (dd-mm-yyyy)							

SEC 2.0 Micro Small &Medium Enterprises (MSME) / Udyam Registration Details									
Sr. No	Description	Details						Remarks	
1	MSME Udyam Registration Number							Please attach self-attested and stamped Copy of MSME Udyam Registration certificate	
2	Date of Udyam Registration							As mentioned in Registration Certificate.	
3	State of Udyam Registration				District of Udyam Registration				As mentioned in Registration Certificate.
4	Registration Category	Micro		Small		Medium		Tick against correct option as mentioned in Registration Certificate. 01- Micro / 02- Small/ 03 - Medium	
5	MSME Social Category Status - 1	General		SC/ST		OBC		Tick against correct option as mentioned in Registration Certificate. 01- General / 02- SC/ST / 03 - OBC	
6	MSME Social Category Status - 2	Women		Physically Challenged		Others		01 - Women / 02 - Physically Challenged / 03 - Others	
7	Registered activities for MSME							As mentioned in Registration Certificate. 01 - Manufacturing 02 - Services	
8	Proprietor/Partners/ Promoters details belonging to Schedule cast/Schedule tribe (SC/ST)/ Women Entrepreneurs							Please provide CA Certificate for sharing holding pattern along with caste certificate/ Aadhar for SC/ST/ Women partners. (Please note that in case no certificate is enclosed for SC/ST/Women, it shall be deemed that the entity owners do not fall in the category.)	
I/We confirm that all the information provided above is correct and belongs to my organization/ business.									
(Vendor Name)		(Vendor Code in BPCL) [applicable in case details to be updated for existing vendor code]		(Name & Signature of Authorized Signatory)			(Company Seal)		
Date (dd-mm-yyyy)									

SEC 3.0		GST Registration Details															
S.No	Particulars	Details															
1	Vendor Name														As per GST Registration Certificate		
2	Vendor Code															Leave blank for new vendor. Mention existing vendor code for updation of details.	
3	Email ID																
4	Mobile No.	+	9	1	-												
5	GST Registration Status	Registered				Composition				Unregistered				Tick against correct option			
6	If Unregistered, reasons	Below Threshold Limit													provide details		
		In process of registration															
		others, pl. specify															
7	Whether located in SEZ	Yes				No									Tick against correct option		
8	GSTN No./ Composition Registration No.														Please attach the self-attested registration Certificate		
9	Address as per GST Registration for the state	Address															
		City															
		State															
		Pin Code															
10	Whether having multiple GST registration in a state	YES				if Yes, Business Division						NO		Pl tick wherever applicable. If Yes, specify business Division			
I/We confirm that all the information provided above is correct and belongs to my organization/ business.																	
(Vendor Name)				(Vendor Code in BPCL) [applicable in case details to be updated for existing vendor code]				(Name & Signature of Authorized Signatory)				(Company Seal)					
Date (dd-mm-yyyy)																	

BPCL VENDOR MASTER - CREATION/ UPDATION FORM FOR BANK DETAILS

SEC 1.0

National Electronic Fund Transfer (NEFT) Mandate

S. No	Particulars	Details																
1	Vendor Name																	As per GST Registration Certificate
2	Vendor Code																	Leave blank for new vendor. Mention existing vendor code for updation of details.
3	Particulars of Bank Account																	
3(a)	Name of the Bank																	Attach Self attested and stamped copy of cancelled cheque or Duly Filled latest bank certificate
3(b)	Name of the Branch																	
3(c)	Bank Address																	
3(d)	City Name																	
3(e)	NEFT IFSC Code																	
3(f)	Bank Account No.																	
3(g)	Type of Account																	

We hereby declare that the particulars given above are correct and complete. If the transaction is delayed or lost because of incomplete or incorrect information, We would not hold the company responsible.

Date

 (Name & Signature
of Authorized
Signatory)

(Company Seal)

Bank Certificate for BPCL's purpose

We certify that the details given above are correct as per our records.

Date

 (Name & Signature
of Authorized
Official of bank)

(Bank Seal)

TENDER FOR

**EPCM SERVICES FOR PETRO RESID FLUIDIZED CATALYTIC
CRACKING (PRFCC) UNIT AND ITS ASSOCIATED FACILITIES AT
MUMBAI REFINERY**

TENDER REF. NO. : 1000440719

TECHNO COMMERCIAL DOCUMENT

Contents

CHAPTER-1	4
1.0 INTRODUCTION	4
2.0 PROJECT DETAILS	4
3.0 PROJECT EXECUTION METHODOLOGY AND IMPLEMENTATION STRATEGY	11
4.0 PROJECT LOCATION	11
5.0 ROLE OF CONSULTANT	15
6.0 ENGINEERING PROCUREMENT AND CONSTRUCTION MANAGEMENT	18
7.0 PROJECT MANAGEMENT ORGANISATION	21
8.0 TIME OF COMPLETION	24
CHAPTER-2	25
1.0 SCOPE OF THE PROJECT	25
2.0 PROJECT MANAGEMENT	25
ANNEXURE-I	43
1.0 SCOPE OF WORK	43
EXHIBIT-A	48
1.0 REVIEW AND FINALIZATION OF PROCESS PACKAGES	49
2.0 RESIDUAL PROCESS ENGINEERING	49
3.0 QUALITY CONTROL:	53
4.0 INFRASTRUCTURE/PRE-PROJECT PHASE	53
5.0 HAZOP STUDY:	53
6.0 DETAILED ENGINEERING:	54
EXHIBIT-B	66
1.0 SCOPE OF WORK	66
2.0 SERVICES DURING PROCESS DESIGN / FEED REVIEW PHASE	67
ANNEXURE-II(A)	80
1.0 PROJECT MANAGEMENT	82
2.0 DETAIL ENGINEERING	82
3.0 PROCUREMENT AND CONTRACT SERVICES	94
4.0 WAREHOUSE/STORES MANAGEMENT	100
5.0 EXPEDITING SERVICES	100
6.0 INSPECTION	102
7.0 EXECUTION	104
8.0 CONSTRUCTION MANAGEMENT AND SUPERVISION	104
9.0 ARCHIVES MANAGEMENT	107
10.0 SPARE PARTS MANAGEMENT	107
11.0 PRE-COMMISSIONING & ASSISTANCE IN START-UP /COMMISSIONING	108
12.0 HEALTH, SAFETY AND ENVIRONMENT GUIDELINES	113
13.0 PROJECT QUALITY GUIDELINES	113
14.0 COMPUTER SOFTWARE REQUIREMENT	114
ANNEXURE-II(B)	115
1.0 SCOPE OF WORK	115
2.0 PROJECT EXECUTION	120

3.0	SERVICES PRIOR TO THE AWARD OF PACKAGE	120
4.0	PACKAGE CONTRACTOR'S MANAGEMENT DURING VARIOUS PHASES.....	121
5.0	SERVICES FOR PACKAGE EXECUTION	123
6.0	PROCUREMENT SERVICES	130
7.0	MODULARIZATION SCOPE OF CONSULTANT	132
8.0	MATERIAL CONTROL AND WAREHOUSE MANAGEMENT	138
9.0	SPARE PARTS MANAGEMENT	139
10.0	PRE-COMMISSIONING, COMMISSIONING AND PERFORMANCE TEST RUN	139
11.0	PROCESS GUARANTEES, RECTIFICATION AND DEFECT LIABILITY	142
12.0	HEALTH, SAFETY & ENVIRONMENT	143
13.0	MISCELLANEOUS.....	143
14.0	COMPUTER SOFTWARE/ COMMUNICATION REQUIREMENT	143
15.0	General	145
	ANNEXURE-III	146
1.0	INTRODUCTION.....	146
2.0	BASIS OF DESIGN	147
3.0	PROCESSDEFINITION	147
4.0	MECHANICAL DESIGN.....	151
5.0	UTILITIES, CHEMICALS ANDCATALYSTS	151
6.0	PROCESS EQUIPMENTDATA	153
7.0	SAFETY, HEALTH &ENVIRONMENT	160
8.0	PIPING & INSTRUMENTATIONDIAGRAMS	162
9.0	PIPING SPECIFICATIONS	167
10.0	ELECTRICAL AND INSTRUMENTATION	168
11.0	SUPERVISORY OPERATING MANUAL	170
12.0	SPECIAL EQUIPMENT.....	171
13.0	BDEP FOR TERTIARY SEPARATION SYSTEM.....	171
14.0	MECHANICAL DESIGN OF REACTOR AND REGENERATOR SECTION	172
	APPENDIX-A.....	173
	APPENDIX-B.....	175
	ANNEXURE-IV	176
	ANNEXURE-V	178
	CHAPTER-3	180
	CHAPTER-4	183
	CHAPTER-5	197
	CHAPTER 6	214

CHAPTER-1**PROJECT DESCRIPTION****1.0 INTRODUCTION**

BPCL Mumbai Refinery (MR) has crude processing capacity of 12.0 million Metric Tonnes per Annum (MMTPA). The refining capacity has been augmented to the present level through progressive revamps, addition of various process units and incorporation of advanced refining technologies.

BPCL intends to set up a Petro Resid Fluidized Catalytic Cracking (PRFCC) unit to maximize Propylene and transport fuel & minimize bottoms from MR.

BPCL intends to line up Engineering Procurement and Construction Management (EPCM) for the setting up of Petro Resid Fluidized Catalytic Cracking (PRFCC) Unit and its associated facilities at Mumbai Refinery.

2.0 PROJECT DETAILS

The following facilities are being envisaged as part of the project:

2.1 PRFCCU and Associated Facilities at Mumbai Refinery:**2.1.1. Petro Resid Fluidized Catalytic Cracker (3 MMTPA):**

A new Petro Resid Fluidized Catalytic Cracking (PRFCC) of capacity 3 MMTPA. PRFCCU process converts a feed mixture consisting of Vacuum Residue (VR), Vacuum Gas Oil (VGO) and Un-Converted Oil (UCO) into Propylene, High Octane Gasoline, Light Cycle Oil, and Slurry Oil. Additionally, off gases are also produced. The main intent of the process is to maximize Propylene production.

2.1.2. Propylene Recovery Unit (Part):

Propylene Recovery Unit separates chemical grade Propylene, and Mixed C4s from treated LPG.

Note: PRFCCU block consists of PRFCCU, PRU(Part) in as a single complex.

2.1.3. Amine Regeneration Unit:

New unit required to process additional ~ 8500 MT/D Rich MDEA.

2.1.4. Caustic Merox Unit/Unsaturated LPG Treating Unit (UGPT):

The Unsaturated LPG Treating Unit removes sulfur compounds (Mercaptans, H₂S and COs) from amine washed LPG received from PRFCC.

2.1.5. Purge treatment unit: For treatment of effluent generated from wet gas scrubber

Note: ARU, Caustic Merox and PTU are in as a single complex across the Road. Based on the block size of the PTU, the decision to locate the PTU within the ARU–Caustic Merox block or elsewhere within the refinery premises shall be jointly made by the Owner and the Consultant.

2.1.6. Sour Water Stripper (SWS-4):

Revamp required to accommodate additional ~65 m³/hr of sour water from PRFCCU.

Note: The revamp will be executed during Plant turnarounds. The dates of the turnarounds will be finalized subsequently after the award of consultant.

2.2 The following new utility systems, but not limited to, are considered to be added at MR for meeting the utility requirements along with PRFCC and integration with existing facilities.

2.2.1. Re-Circulating bearing cooling water envisaged is ~1200 m3/hr:

One working cell with no spare cell of 1200 m3/hr capacity and 2 pumps (1 working+1 standby) of 1200 m3/hr capacity each will be considered as a minimum requirement to meet the bearing cooling water requirement for this project.

2.2.2. Raw Water envisaged is ~480 m3/hr (Hold):

Two sets of pumps will be considered as a minimum requirement

- a. Two (1 operating + 1 standby) Service water pumps with capacity of 320 m3/hr (HOLD) have been considered which will transfer the service water to new PRFCC process users.
- b. Two (1 operating + 1 standby) Service water pumps with capacity of 187 m3/hr have been considered which will transfer the raw water to new utility systems.

Inputs from the Package vendor to be sought by consultant to arrive at the actual requirement of Raw water and subsequent sizing.

2.2.3. Boiler Feed Water envisaged is ~ 424 TPH:

A Tray and Spray type Deaerator with a capacity of 424 TPH capacity shall be provided. Two HP BFW pumps (1 working+1 standby) of 240 TPH capacity each and two MP BFW pumps (1 working+1 standby) of 184 TPH capacity each will be considered as a minimum requirement to meet the requirement of both HP BFW and MP BFW. Deaerator, Deaerator drain pot, Deaerator silencer, Chemical Dosing skids are also envisaged as minimum requirement.

2.2.4. Sea Water Cooling system envisaged is ~28,000 m3/h capacity. New Cooling Tower with 7 working cell and one spare cell of 4000 m3/hr each cell and with two sets of pumps each having 3 pumps (2 working+1 standby) of 7000 m3/hr capacity each will be considered to meet the cooling water requirement for this project. Sump, Makeup Pumps 1W+1S, Makeup Sea Water Booster Pumps 1W+1S, Silting Chamber 1&2, substation, filter system are also envisaged as minimum requirement. Sea cooling requirement of existing MTBE & GTU units is shifted to this new sea cooling tower.

2.2.5. Modification of Sea cooling water supply/return, to/from, MTBE & GTU units, to closed circulation system (PRFCCU cooling tower) is also included in scope.

2.2.6. Modification of Sea cooling water supply/return, to/from, ISOM RGC & BBU units, to closed circulation system (i.e. RMP sea cooling water system) is also included in scope.

2.2.7. DM Water capacity envisaged is ~125 TPH: One new DM water chain of capacity ~3000 m3/day (i.e. 125 m3/hr*24 hrs.) will be considered to meet the DM water demand. As a minimum requirement

- a. Two (1 operating + 1 standby) DM water transfer pumps with capacity of 275 m3/hr have been considered which will transfer the DM water to all the process users and
- b. Two (1 operating + 1 standby) DM water transfer pumps with capacity of 193 m3/hr have been considered which will transfer the DM water to new BFW system.

2.2.8. Compressed Air System envisaged is ~7125 Nm3/hr (Instrument Air) & ~4957 Nm3/hr (Plant Air): Shall be catered from existing facility. However, a new HP air compressor with 250 N m3/hr (along with associated system) capacity and a new HP air receiver for the same is considered.

2.2.9. Firefighting facilities description: Firefighting facilities for the PRFCC and its associated units. is included in EPCM scope.

2.2.10. 4 nos. Mounded Bullets for Propylene storage of capacity: C3 Mix Storage mounded bullets 04Nos, ~2000 M3 Each, loading, unloading, transfer Pumps facility and required loading arms & bays for additional Propylene transfer through tank lorries. These bullets are positioned next to the existing LPG and C3 mix bullets, any hookup / interchangeability with the existing facilities like pump, bullets etc. shall be included in the scope.

SERVICE	TYPE	QUANTITY	CAPACITY
C3 mix (Propane and Propylene mixture)	Mounded Bullet	Four	~2000 M3 capacity each

Consultant scope shall include adequacy study for loading and transfer facility including dispatch bays for C3 Mix from the bullets to truck lorries. And subsequent EPCM activities for the implementation of the recommendation shall be included in the scope of consultant.

2.2.11. New Electrical GIS / HT substation and LT substation to cater to the additional load of ~ 84 MW of PRFCC. Location of LT Substation is envisaged above the existing CDU4 substation, however, if space is available near the GIS / HT Substation, Consultant to locate the LT substation adjacent to GIS / HT substation.

2.2.12. Emergency DG set to cater to emergency load requirement of PRFCC unit and associated units to be worked out and installed.

2.2.13. MP Steam (Net): Net max MP steam consumption post PRFCC during start up is 8334 TPD and same shall be catered from existing facility.

2.2.14. Nitrogen capacity envisaged is ~4270 Nm³/hr (Gaseous): Shall be catered from existing facility. Facilities for piping connections from existing Nitrogen plant/header to new facilities to be made.

2.2.15. Consultant scope shall include review of steam balance, water balance, adequacy of existing Effluent Treatment Unit and flare system of Refinery. Licensor input if required shall be sought by consultant. In case of any recommendation measures, the subsequent EPCM activities shall be included in the Consultant. Consultant scope shall include EPCM activities of flare mitigation, if any.

Consultant to undertake a comprehensive Flare Adequacy Study for the refinery. The scope shall include a detailed review of the existing flare systems and identification and execution of mitigation measures to ensure compliance with safety, operational, and environmental standards.

a. Review of Existing Studies and Inputs:

- i. Consultant shall review all relevant documentation including the static and dynamic flare studies previously carried out by BPCL.
- ii. Consultant shall also consider inputs and recommendations provided in Process Licensor's Basic Design Engineering Packages (BDEPs) and other relevant engineering documents/packages which were/ will be prepared for PRFCC and other associated facility project at MR.

b. Detailed Flare Adequacy Assessment:

- i. Perform a comprehensive adequacy study for the existing flare systems across all process units in the refinery.

c. Mitigation Measures:

- i. Propose detailed and implementable mitigation measures for each unit to minimize the load in the flare system.
- ii. The following measures, recommended in earlier studies, adequacy reports done by earlier PMC, BDEPs, and OEM documents, shall be treated as minimum mandatory actions:
 - Installation of HIPPS (High Integrity Pressure Protection Systems) wherever required. All the mitigation measures shall conform with respect to applicable codes, standards, and best practices.
 - Segregation of Sea Cooling water (SCW) line to minimize load during SCW failure
 - List of mitigation measures identified by earlier studies which have to be considered for execution

Gasoline Hydrotreater Unit – (GTU)	Splitter	Splitter Overhead Air condenser and Splitter reflux pumps to be put on emergency power
Naphtha Splitter (RFU unit)	Splitter	Providing emergency power to 50% of fans of Naphtha Splitter overhead Air Condenser and Reflux pumps
Diesel Hydrotreater Unit	Product stripper	Installation of HIPPS for shutting off stripping steam to Stripper column with Pressure High High logic (pressure switch)
Diesel Hydrodesulphurization Unit	Stripper Column	Installation of HIPPS for shutting off stripping steam to Stripper column with Pressure High High logic (pressure switch)
Recommended mitigation by HIPPS installation in PRFCC		
PRFCC	High Pressure (HP) receiver	Steam to stripper reboiler cut with HIPPS
PRFCC	Naphtha Splitter	Reboiler steam cut out with HIPPS
PRFCC	C3/C4 splitter	Reboiler steam cut out with HIPPS
PRFCC	Main Column/LCO Side Stripper	Steam to main column and a side striper cut out by individual HIPPS
PRFCC	Mitigation for Sea Cooling water failure	Plant feed cut out logic with High Pressure signal from 3 equipment transmitters with voting
PRFCC	Mitigation for Sea Cooling water failure	Plant feed cut out logic with High Pressure signal from 3 equipment transmitters with voting

- d. Additional mitigation measures recommended by the consultant based on the assessment shall also be implemented, subject to BPCL approval.

- e. Consultant shall ensure that all proposed modifications and recommendations adhere to relevant international standards and codes, including but not limited to:
 - i. API 521 (Pressure-Relieving and Depressuring Systems)
 - ii. API 537 (Flare Details for General Refinery and Petrochemical Service)
 - iii. API 520 Part I & II
 - iv. IEC 61508/61511 (for HIPPS design and implementation)
- f. Consultant scope includes designing the above three mitigation and execution of the same. If required Consultant to consult with Licensor for finalization of the schemes.

Note: Flare study report carried out earlier will be shared with successful bidder.

2.2.16. Consultant scope shall include review of motor and steam driven drives and in case of any recommendation, Subsequent EPCM activities same shall be included in the consultant.

In view of the above, Consultant shall provide updated utility balance.

2.2.17. Caustic Handling System: Caustic handling system minimum of Caustic Storage tank 01 No, of capacity 535m³ Caustic Pumps 1W+1S is envisaged.

2.2.18. Consultant scope includes Adequacy check of existing MS and HSD tanks / venting / nozzles for increased pumping capacity / tanks rationalization to be checked considering the increase in evacuation and subsequent EPCM activities for implementing the recommendations.

2.2.19. Consultant scope includes review / Adequacy check of existing Feed tank, Intermediate and product storage requirement and subsequent EPCM activities for implementing the recommendations.

2.2.20. Overall process coordination (OPC) data to be updated.

Note: Integration of new Utility & Offsite facilities with existing Utility & Offsite facilities are included in the Consultant scope of work.

2.2.21. Other general facilities such as Control Room, Substations, Satellite Rack rooms, UPS & Battery charger systems, Fire alarm communication system, Plant communication system such as Intercom facility, PA system etc., Materials Stores / warehouse, are required for the projects are included in the scope of consultant.

2.2.22. Layout / GAD preparation for Pipe Rack / track 7, 9, 12 pipeline relocation: The consultant shall develop the layout and general arrangement drawing (GAD) for relocating the existing pipelines from Pipe Racks 9 and 12 into Pipe Racks 11, 14, 7, and 12. While doing so, the consultant must consider constructability aspects, ensuring that all OSBL pipelines of the PRFCCU are routed within the same Pipe Rack corridor (11/14/7/12).

Although shifting of PR-9 and PR-12 is defined under Owner's scope, EPCM shall actively support these activities. Without EPCM involvement, inspection readiness, alignment, and piping integration could be adversely affected.

Note: The preparation of layout and General Arrangement Drawings (GAD) for the relocation of existing pipelines from Pipe Racks 7, 9 and 12 into Pipe Racks 11, 14, 7, and 12 shall be within the consultant's scope. Subsequent execution activities pertaining to relocation of Pipe rack / track 7,9 and 12 into pipe rack 11/14/7/12 shall be carried out by OWNER. However, the consultant shall assist BPCL in the shifting activities of PR-7, PR-9 and PR-12, particularly in areas such as Quality assurance and site inspection.

2.2.23. The consultant shall develop the layout and general arrangement drawing (GAD) for relocating the existing pipelines from HVU pipe rack, LPG Merox unit to create a space for ARU block.

Note: The preparation of layout and General Arrangement Drawings (GAD) for relocation of HVU pipe rack, LPG Merox shall be within the consultant's scope. Subsequent execution for relocation, LPG Merox & TG (of FCCU) Set dismantling shall be done by OWNER. However, the consultant shall assist BPCL in the activities, particularly in areas such as Quality assurance and site inspection.

2.2.24. The consultant scope shall include design and EPCM activities necessary for creating space, including any required modifications or rerouting of existing piping, structural supports, and utility systems within the refinery, along with their execution.

2.2.25. Consultant scope shall include Design and EPCM activities for provision of Culverts with Slab along the pipe track 12 (between Road 7 and 9) to facilitate crane movement / placement for heavy erection construction activities.

2.2.26. Buildings envisaged for Substation / Control Rooms and their tentative block size are given below. For detailing and residual engineering to reach the logical conclusion is in the consultant scope. Type / Material of Construction considered is RCC Frame structure with RCC wall.

SL No.	BUILDING NAME	SIZE OF BUILDING		PLAN AREA (SQM)	NO. OF STOREYS	BLAST RESISTANT
		LENGTH (M)	WIDTH (M)			
1	MAIN GIS SUB-STATION (New)	Detailing to be done by consultant				
2	CONTROL ROOM FOR PRFCC (New)	84	54	4536	1 Storied	BLAST PROOF
3	SUBSTATION FOR PRFCCU (LT LOAD) (New / Modification)	84.8	30	2544	2 Storied	NON-BLAST
4	NEW SUBSTATION FOR PRFCCU (HT LOAD)	52	31	1612	2 Storied	NON-BLAST
5	SUBSTATION FOR CT (NEW)	56	22	1232	2 Storied	NON-BLAST
6	DG SHED (NEW)	25	12	300	1 Storied	NON-BLAST
7	PUMP HOUSE FOR BULLETS	35	10	350		NON-BLAST

Note: Consultant Scope shall include Control room / Substation infrastructure adequacy study for modification/revamp/additions in the existing facilities. Adequacy of field instruments including control valves shall be verified wherever modifications/revamp in existing units are proposed. Implementation (EPCM activities) of recommendations of adequacy study shall also include in the consultant scope.

Table-1: FACILITIES AT MR

Sr No	Unit Name	Process Package by

1	Petro Resid Fluidized Catalytic Cracker (PRFCC)	Licensor
2	Propylene Recovery Unit (PRU) part	
3	CO Boiler, Wet Gas Scrubber, Purge Treatment Unit (PTU), Power Recovery Turbine	Package by vendor (licensor will give specification)
4	Sour Water Stripper (SWS)	PMC
5	Amine Regeneration Unit (ARU)	PMC
6	Caustic Merox Unit / Unsaturated LPG Treating Unit (UGPT)	Licensor
7	Sea Water Cooling Tower and Bearing Cooling Tower	PMC
9	Boiler Feed Water System (BFW)	PMC
10	Process Air Compression System (Instrument & Plant Air)	PMC
11	Raw Water system	PMC
12	Offsite Piping	Consultant
13	Caustic Facility	PMC
14	Mounded Bullets for Propylene storage (4 no.)	PMC
15	Propylene dispatch facility including loading & transfer and additional bays	Consultant
16	Emergency DG Set	PMC
17	DM Plant	PMC
18	Flare and mitigation	Consultant
19	ETP – Effluent Treatment plant mitigation	Consultant
20	Fire Fighting Facilities	Consultant

Sr No	Unit Name
1	HT and LT Substation for ISBL
2	Main GIS substation along with Sub- station for ISBL
3	Substation for OSBL facility
4	Control Room and modification of existing Control Room
5	Warehouse modification

6	Modification / relocation of entry gates, roads / cables / pipe bridges, culverts, re-routing of pipelines, solar panels, light poles, fire MCP (manual call points) and other hinderances as per ODC / OWC survey report or Owner / consultant recommendation for ODC / OWC movement etc.

Definition of Licensor, PMC, Consultant and OWNER is given in the Special condition of Contract. The above facilities and capacities are based on the Basic Design Engineering Package (BDEP), and Detailed Feasibility Report (DFR) for the PRFCC, Wet Gas scrubber, Caustic Merox, PTU, PRU (Part) which were carried out as part of pre-project activities by UOP (the Licensor) / EIL (the PMC) and ARU, SWS, U&O & Associated facilities which were carried out by EIL (the PMC). Wherever Consultant are mentioned in the Table 1, the consultant to start with the zero and detailing to be carry out by consultant for implementation. The scope of work includes, but is not limited to, the Consultant firming up, reviewing, updating, preparing, finalizing, augmenting, and/or undertaking detailed & residual engineering and further detailing of the requisite facilities, liaison with licensor selection, PMC, OWNER as necessary to ensure the completeness and integration of the project.

Consultant to provide PRFCC unit Catalyst storage requirement in the warehouse and logistics procedure, considering higher catalyst addition rate on daily basis.

Note: The facilities / capacities are indicative and Consultant to firm up and / or add / requisite facilities as necessary

3.0 PROJECT EXECUTION METHODOLOGY AND IMPEMNTATION STRATEGY

It is proposed to implement the project “PRFCC” through Conventional EPCM and Package mode of execution as per following

- a. Licensed units of PRFCC, PRU (part), Caustic Merox, PTU, WGS and Open art unit- ARU through EPCM / Package mode may also include composite works, Piping spool works and Modular construction.
- b. Cooling Towers facility, Mounded bullets facility, DM Plant facility, Offsite piping facility through EPCM /Package methodology.
- c. Open art unit - SWS, other Utilities & Offsites facilities, Offsite piping / modification to existing culverts/ pipe bridges under conventional EPCM mode may also include composite works, Piping spool works, Modular construction Methodology.
- d. New / modification of Substations, Satellite Rack Rooms, Control rooms and warehouse through EPCM / Package methodology.

Above mentioned mode of execution is indicative and also, during the course of project, the Consultant can suggest suitable packages with or without Free issue material (FIM) for betterment of project implementation considering project schedule and cost. The same may be implemented in consultation with OWNER.

4.0 PROJECT LOCATION

4.1 PRFCC and associated facilities will be located at BPCL Mumbai refinery Plot plan prepared by PMC.

4.2 Consultant shall review, update, prepare and finalize the layouts for new facilities / revamp at Mumbai refinery envisaged under the project ensuring Process integration, productivity, efficiency

& cost effectiveness and compliance with the latest OISD standards and other guidelines/statutory requirements and accordingly update the Plot Plan in consultation with BPCL.

- 4.3 Tentative Units Blocks Plot Plan for MR is attached with the tender document as an appendix 2 of SCC.
- 4.4 Equipment layout for PRFCCU, PRU (Part) has been prepared by PMC. Review and finalization of equipment layout considering the prevailing statutory norms (i.e. OISD, PESO, PNGRB, DISH etc.) shall be in the scope of the Consultant.
- 4.5 Equipment layout for Caustic Merox, ARU prepared by PMC shall be modified considering inclusion of PTU and deletion of SRU which is included in the scope of consultant. Review, Update, Prepare and finalization of equipment layout considering the prevailing statutory norms (i.e. OISD, PESO, PNGRB, DISH etc.) shall be in the scope of the Consultant. Based on the block size of the PTU, the decision to locate the PTU within the ARU–Caustic Merox block or elsewhere within the refinery premises shall be jointly made by the OWNER and the Consultant. Based on the block size of the PTU, the decision to locate the PTU within the ARU–Caustic Merox block or elsewhere within the refinery premises shall be jointly made by the Owner and the Consultant.
- 4.6 Preparation and Finalization of other Equipment layout Utilities and Offsites facilities, SWS shall be in the scope of the consultant. Preparing and finalization of equipment layout considering the prevailing statutory norms (i.e. OISD, PESO, PNGRB, DISH etc.) shall be in the scope of the Consultant.
- 4.7 No major changes or relocations are envisaged, except for two facilities pertaining to the cooling tower system (incl. Cooling tower substation & Caustic tank) and the control room (incl. Satellite Rack Room) which may need to be relocated, subject to CRZ approval
- 4.8 As per Plot plan attached in appendix 2 of SCC, Cooling tower facilities / Caustic tank is shown in the area of existing Rail wagon gantry and white oil gantry. PRFCCU Control Room is shown in the area of admin building (North, Annex Block, Parking Area). To avoid the dismantling of existing Rail wagon gantry facilities, White oil gantry facilities and Admin Building (North, Annex Block, Parking Area), BPCL approached MoEF&CC for CRZ clearance. Once the CRZ clearance is obtained, the Cooling tower facility will be shifted to Main oil Catcher (MOC) area / any other location within MR premises whereas Control Room will be shifted to Scrap yard / any other location within MR premises. Approval process is time consuming and the timeline for the decision to locate these facility shall be decided between OWNER and Consultant based on the project completion schedule.
- 4.9 The size of the Plot shown for Control Room & SRR is tentative, Consultant to resize the plot post detailing and advise OWNER for setting up the facility in the minimum space available area in and around Admin building taking into consideration of combination of factors related to number and size of equipment's, functionality, the need for future expansion, statutory distance requirements etc.
- 4.10 Two 62” Sea Cooling Water Supply headers and two 62” Sea Cooling Water Return headers are envisaged from the offsite cooling tower to the battery limits of the respective licensed/open-art units, as per the U&O BDEP. Further size reductions occur from the battery limits to the individual sections of each unit and to various equipment. The two-header philosophy shall be reviewed from the perspective of flare mitigation, pipeline routing, and constructability. The subsequent EPCM activities related to this review fall within the scope of the consultant.
- 4.11 LOCATION: Cooling Tower Facility

The Cooling Tower facility (incl. Cooling tower substation & Caustic tank) will be located on either

Option 1: Area of present Rail wagon Gantry and White oil Gantry after dismantling of Rail wagon Facilities, Rail tracks, Relocation of White oil Gantry towards north.

OR

Option 2: Area of present Main Oil Catcher Basin / any other location within MR premises

In case of Option 1: EPCM Services for Relocation of white oil gantry facilities (~10 bays) is in Consultant's Scope. Dismantling of Rail wagon facilities only is in OWNER's scope.

In case of Option2: Dismantling if any shall be in the Scope of OWNER.

4.12 LOCATION: Main Control Room & Satellite Rack Room

The PRFCC Main Control Room & Satellite Rack Room will be located on either

Option 1: Area of present Admin Building (North, Annex Block, Parking Area) after dismantling Admin Building (North, Annex Block, Parking Area).

OR

Option 2: Area of present Scarp Yard after dismantling of Scrap yard / any other location within MR premises

In case of Option 1 & 2: Dismantling of Admin Building (North, Annex Block, Parking Area) and scrap yard is in OWNER's scope.

In case of Option2: Dismantling, if any, shall be in the Scope of OWNER.

The Consultant shall reassess and optimize the layout and sizing of the proposed Control Room and SRR to ensure compliance with the minimum distance requirements from existing facilities and boundary walls, as specified in OISD-118. In case of consideration of Instrument racks in Control room instead of new SRR closure to process unit, consultant to study the adequacy & cable length limitation with reference to IS signals & FF.

4.13 Over Dimensional Consignment:

The Consultant is advised that several equipment items in the PRFCC (Petro Resid Fluidized Catalytic Cracking) unit and its associated facilities fall under the category of Over-Dimensional Consignments (ODC).

Based on past experience and the Route Survey Report submitted by M/s Boxco dated 16.03.2020, it has been observed that many of these equipment items exceed the transportable size limits permitted through Mumbai roads up to the BPCL Mumbai Refinery.

As per the report and practical constraints:

- a. The maximum transportable dimensions through SPMT (Self Propelled Modular Transporter) / Multi axle trailer to the refinery with minor road modifications are approximately 4.5 meters in diameter and 25 meters in length.

Given these limitations, the following strategies must be considered:

- a. On-site Fabrication of oversized equipment
Note: This approach may hinder other ongoing project activities due to space and Workfront constraints.
- b. Pre-fabrication within BPCL Mumbai Refinery Yard
Note: BPCL has limited space within the refinery, and its availability must be confirmed and planned accordingly.
- c. Modularization: Fabrication of transportable modules at external fabrication yards, followed by on-site assembly.

Each of the above methodologies carries its own advantages and challenges. The Consultant is advised to thoroughly study all feasible options, explore innovative approaches, and select a suitable strategy for each equipment to ensure timely and efficient completion of the project.

Below is a tentative list of potential ODC equipment based on preliminary studies. Please note that the actual list may vary depending on further engineering detailing and updated route survey reports, both within the refinery premises and on the external route conditions in Mumbai.

Sr.NO	Tag	Description
1	171-C-201	MAIN COLUMN
2	171-C-301	PRIMARY ABSORBER
3	171-C-304	STRIPPER
4	171-C-305	DEBUTANIZER
5	171-V-202	MAIN COLUMN RECIEVER
6	171-V-304	HIGH PRESSURE RECEIVER
7	171-V-001	FLARE KOD – 1
8	171-V-002	FLARE KOD – 2
9	171-C-308	NAPHTHA SPLITTER
10	171-V-304	HIGH PRESSURE RECEIVER
11	171-TH-102	FRESH CATALYST STORAGE HOPPERS
12	171-TH-103	HIGH METAL EQUILIBRIUM CATALYST STORAGE HOPPER
13	171-TH-104	LOW METAL EQUILIBRIUM CATALYST STORAGE HOPPER
14	171-R-101	REACTOR
15	171-R-102	REGENERATOR ASSEMBLY
16	171-R-103	REGENERATOR ASSEMBLY
17	172-C-002	EXTRACTOR PLUS (PREWASH & EXTRACTOR)
18	173-C-001	C3/C4 SPLITTER
19	173-C-002	C3 SPLITTER
20	173-V-002	COMPRESSOR SUCTION DRUM
21	180F-V-101	MAIN HP INSTRUMENT AIR RECIEVER
22	178-C-101	AMINE REGENERATOR

Further, Consultant to note that Reactor Regenerator Package incl COB and other 9 ODCs are to be modular constructed in a transportable size to reach the project site and rest to be site assembled & fabricated within the PRFCCU plot due to ODC size movement restriction inside refinery premises and outside refinery by-lanes of Mumbai.

Sr No	Equipment Over Dimensional - Site assembled & site fabricated
1	Reactor
2	Regenerator 1 st stage
3	Regenerator 2 nd stage
4	Main column
5	Stripper
6	Fresh catalyst storage hoppers
7	High metal equilibrium catalyst storage hopper

8	Low metal equilibrium catalyst storage hopper
9	High pressure receiver
10	C3 / C4 Column
11	Stabilizer / Debutanizer
12	Third stage Separator

Note: Main Air Blower consignment size is not known now. The consultant shall provide the same post detailed engineering.

During residual engineering, if in case, the equipment which are not mentioned in the above list falls under the Over dimensional category, then the execution / fabrication philosophy to be jointly decided between the Consultant and the OWNER.

All ODC equipment required to be transported using multi-axle Self-Propelled Modular Transporters (SPMTs) space and turning radius limitations within the refinery premises and the narrow bylanes of Mumbai.

Use of any alternate vehicle type in place of SPMT for transporting certain ODCs may be considered, subject to prior approval from BPCL. Such approval will only be granted after a detailed feasibility study, and BPCL's decision in this regard shall be final and binding. Use of nonstandard trailers is strictly prohibited.

Suitable area at multiple locations (totaling ~ 8,000 m²) will be allocated within Refinery premises to the contractor for setting up yard for temporary construction works (temporary assembly storage, site office etc.). This is excluding areas other than the usage of PRFCCU plot allocated for fabrication of ODC Equipment. Also, this is the area available for other blocks / revamps/ package contract/ Composite contractors / Site contractors planned for execution through EPCM mode. Location of these areas is within range of 2.5 KM from the main installation site within the BPCL Refinery. Utilization of the allocated area inside BPCL premises shall be the responsibility of the execution contractor in coordination with Consultant. Consultant shall include in the contractor scope of work that contractors have to carry out temporary relocation / modification of hindrances viz., scraps, temporary sheds etc. in the vicinity, if any, with permission of BPCL for proper utilization of allocated area. Barricading, Site grading and development of the allocated areas, if required, is under the work scope of the contractor.

Consultant shall include in the contractor scope of work that Structural, Piping pre-fabrication, equipment prefabrications including shotblasting/painting shall be done by contractors outside refinery at their own/rented area without any additional cost and time implication.

Consultant shall also include in the contractor scope of work that any additional area required beyond allocated area within refinery, shall be arranged by contractor outside refinery premises without any time and cost implication to the OWNER.

Consultant shall finalize and manage contractors (PACKAGE contractors, Conventional site contractors, sub-contractor, etc.) for setting up site office, fabrication yard, Lay down area, Blasting/Painting Area, etc.

5.0 ROLE OF CONSULTANT

(FOR DETAIL SCOPE REFER ANNEXURE-1, ANNEXURE-II (A)&II (B) TO CHAPTER-2)

The broad Scope of Consultancy Services for the project is given below but not limited to:

ENGINEERING, PROCUREMENT & CONSTRUCTION MANAGEMENT (EPCM) services for PRFCCU and its associated facilities Project at MR - Overall project management, Developing project procedures and project management plan, activities as listed in technical scope, Review, Updation, preparation and finalization of Basic Design Engineering Package (BDEP) / Process Package/ Design Basis submitted by Process Licensor(s) / PMC, Review, Updation, Preparation and Finalization of BDEP/ Front-End Engineering Design (FEED) for all Licensed & Open Art units, Review, Updation, preparation and finalization of Basic Design Engineering Package for OSBL (Offsite & Utilities), Detailed and Residual engineering for PRFCCU / ARU / SWS / PRU(Part), PTU, Caustic Merox and Utilities & Offsite facilities, Tendering & Award of work packages/Conventional items and other work/contract packages, Tendering and award of long lead items (LLI's), other equipment & items, Preparation of tender documents, Tendering and award of contracts, Review of detailed engineering documents by vendors/contractors, IBR package preparation/ Coordination with GBI for obtaining IBR certification, assistance for Statutory Approvals / Clearances, Procurement & Contract Services Assistance, Project Monitoring, Inspection & Expediting, Quality management, Assistance for Transportation of Over Dimensional Consignments including route survey, Material Control & Warehouse Management, Construction management & supervision including Quality Assurance, Mechanical Completion, assistance in start-up, Pre-commissioning, Commissioning & Performance Guarantee Test Run (PGTR) activities and project closure activities including final bill/invoice for the project at Mumbai refinery of Bharat Petroleum Corporation Limited, India in line with the bidding documents, specifications and conditions.

The Consultant is responsible for engineering, procurement / Procurement assistance, Inspection & Expediting services, including participation in Kick-Off Meeting with vendors / FAT (Field Acceptance Test) / SAT (Site Acceptance Test), construction management / setting up, mechanical completion and commissioning of all facilities that are required for implementing the PRFCCU Project and its associated facilities at Mumbai Refinery and making it operational, even if any facility is not specifically mentioned in this tender document otherwise exclusively mentioned as excluded. **Bidder is required to familiarize himself with the site before quoting.**

The Consultant shall render all necessary services for implementing the project facilities, being not limited to but including services such as

- a. Updation / Preparation and finalization of Engineering design basis.
- b. Conducting P&ID review for Licensed unit, Open Art unit and Utilities & Offsites facilities at Consultant Office / OWNER Office inviting various stakeholders. Update and finalize the same.
- c. Finalization of plot plan, preparation of Equipment layout / 3D models, hydraulics & equipment data sheets etc.
- d. Review, Updation, preparation and Finalization of Basic Design Engineering Packages submitted by respective Process Licensors / PMC.
- e. Review, Updation and finalization of process packages / BDEP for open art units
- f. Review, Updation, Preparation and Finalization of BDEP for Utilities & Offsite Packages and other facilities
- g. Assistance of EPCM includes:
 - i. Preparation of necessary documents required for obtaining various statutory approvals.

- ii. EPCM shall accompany with OWNER to submit all the necessary documents to statutory authority and also prepare & make presentation, if required, to be given to statutory authorities etc.
- iii. Preparation of necessary documents required for carrying out Risk Assessment Study including QRA / RRA Study for the total project.
- h. Review, Updation of BDEP / FEED package with revalidation / rechecking with respect to Mumbai refinery conditions along with the Process performance guarantee.
- i. **Revamp of Existing units:** All the battery limits/ hook up points to be defined by the Consultant in the Tender in consultation with OWNER. Proper integration of these revamped units with other Process units and the resolution of interface related issues shall be the responsibility of the Consultant under this contract. Any changes at battery limit conditions/ interface points (during execution) shall be executed by consultant without any time & cost implication. Consultant shall arrange for Material required for hook ups well in advance to avoid delay in execution.
- j. Residual Design & Engineering for Licensed Units (CONSULTANT to note that the BDEP format / scope will be licensors specific and it is expected that the scope under the Residual Design and Engineering will be based on the available details in the BDEP of the various licensing units for completion of entire project).
- k. Residual Design & Engineering and detailed engineering for Open Art Process Units, U & O.
- l. Utility and offsite details provided in above tables are indicative and are subjected to minor change during Review and finalization.
- m. Integration of new Utility & Offsite facilities with existing Utility & Offsite facilities. are included in the scope.
- n. EPCM scope includes other facilities such as Control Room, Substations, Satellite Rack rooms, UPS & Battery charger systems, Fire alarm communication system, Plant communication system such as Intercom facility, PA system etc., Materials Stores / warehouse, are required for the projects.
- o. All the electrical equipment has to be energy efficient and standardization to be kept in mind while selecting.
- p. The consultant is required to locate the project facilities in the areas identified by BPCL within the existing Refinery complex and prepare plot plan for the facilities adhering to statutory & OISD norms.
- q. Consultant scope shall include design and engineering analysis required for any space creation, including modification or rerouting of existing piping, structural supports, and utility systems within the refinery.
- r. The Consultant shall conduct a study, propose a suitable design, and execute the construction of at least three (3) or more entry points in the form of culverts over the existing PT-12 to facilitate vehicular movement from Road 12 to the PRFCCU plot.

If any existing facility or utility is found within the proposed alignment or needs to be relocated, it shall be considered within the Consultant's scope of work.

6.0 **ENGINEERING PROCUREMENT AND CONSTRUCTION MANAGEMENT**

BPCL intends to implement and commission the project as per the planned schedule or earlier. The scope of work of CONSULTANT shall broadly include but not limited to:

- a. Overall Project Management
- b. Ensure design consistency across all new units/ facilities and existing refinery complex,
- c. Execute the project as per the implementation methodology defined in the tender document.
- d. Contractor survey / vendor survey, Finalization of Vendor List/ Master supplier / Contractor list for each equipment/ machinery.
- e. Residual and Detailed Engineering for PRFCCU and associated complete Utility & Offsite facilities pertaining to entire Project.
- f. Finalization of packages, Preparation / Updation of documents required for equipment(s) / material(s) ordering and award of package(s) / Conventional contract(s) for Licensed / Open art units and Utility & Offsite, Inspection & expediting services, Participation in vendor(s) / contractor(s) route surveys, Construction management of package (s) / Conventional contractor(s), Open art units and Utility & offsite, warehouse / Warehouse contract(/or)s management, Pre- commissioning and commissioning of units, Closure of supply / service contracts and performance guarantee test.
- g. Services towards Procurement, Tendering, Supply, Fabrication, Manufacturing, Expediting, delivery, warehouse management, Construction and Installation for PRFCCU and associated complete Utility & Offsite facilities.
- h. Procurement & tendering activities for the project. Preparation of tenders and subsequent evaluation and award recommendation as defined in the tender elsewhere.
- i. Finalization for the Process and Engineering design basis for all the disciplines including Piping Material Specifications (PMS) and Valve Material Specifications (VMS). If licensors insist on following their specific PMS/VMS, CONSULTANT shall convert/merge licensor specific PMS/VMS into the requirements specific to BPCL/Projects.
- j. Develop equipment layout.
- k. Carry out Constructability study for the project.
- l. Value engineering and optimization
- m. Develop drawings & necessary documentation for submission for statutory approvals and provide technical support.
- n. **Procurement & Service cost estimates:** Preparation of +/- 10% cost estimate of all procurement items & service contracts during tendering activity. All estimates shall accompany the basis of the cost estimate.
- o. Develop Project schedules, project management plan and risk management plan for the project.
- p. Develop contracting and subcontracting strategies i.e., definition of packages, Prequalification, Requests for Quotation, RR Package Contracts, ODC site fabrication Contracts, Composite and Piping spool contract, Main Electrical & Instrument contractors etc.

- q. Engineering, procurement and construction management of the project scope including support facilities such as Substations, SRR, control rooms, warehouse, contractor amenities etc.
- r. Implementation of best-in-class safety systems during construction & commissioning of the project as per statutory norms
- s. Consultant to visit the site and acquaint themselves with the site conditions. Actual site data to be taken by consultant for offsite/ utilities and tie ins,
- t. Preparation, review & finalization of the HSE Policy, Contracting & procurement policy.
- u. Finalization of project procedures, Project coordination plan, project execution plan, project electronic communication/IT system, project schedule, project resource plan, Construction philosophy etc. as per defined scope.
- v. Schedule tracking, expediting, and monitoring to ensure timely completion.
- w. Inspection and quality assurance
- x. Assistance for pre-commissioning, commissioning and PGTR
- y. Prerequisite for pre-commissioning, commissioning and startup, such as start-up filling materials etc.
- z. The consultant is responsible for driving the execution of the technological interventions, specified in digital section (Chapter -5) of the tender document, and will be responsible for its integration and execution with the other contractors/consultants.
- aa. Project documentation and smart plant data handover system,
- bb. Handing over project to OWNER

EPCM shall implement the project through a dedicated project task force at their head office and at project site as required during the project, with support of all discipline expert groups.

BPCL proposes to execute the project on Conventional EPCM & Package methodology wherever applicable as defined in the 'Project execution methodology and implementation strategy' and 'Role of Consultant' above but not limited to.

- a. **For Conventional mode:** Review, Preparation, Updation and Finalization of BDEP / FEED / Process Package / Design Basis for Licensed and Open Art Units & all OSBL (Utilities & Offsite) of the project including detailed engineering as defined above, which includes, but not limited to, Utilities and Offsites, interconnecting piping, adequacy check of existing pipe racks, overhead cable tray/Trench, IRC/ERC (Instrumentation Road Crossings/Electrical Road Crossings) etc. Overall Project Management, Detail Engineering, Procurement and expediting services, Ordering of LLI's Items (delivery more than 14 Months), Non-LLIs & all materials / equipment required for project completion, Tendering (on E-tendering basis) / Tendering Assistance and Award of Works contracts / conventional contracts. Overall Project Management, Review & approval of Detailed Engineering and Drawings, Inspection & Expediting Services, warehouse management, monitoring, Construction Management including supervision, Quality Assurance, IBR package preparation/ Coordination with GBI for obtaining IBR certification, Assistance in Start-up, Commissioning & Performance Test Runs for the units under this mode of Project (Licensed, Open Art units) and allied Utility & Offsite facilities at Mumbai Refinery.
- b. **For Package mode:** Review, Preparation, Updation and Finalization of BDEP / FEED / Process Package/ Design Basis for Licensed and Open Art Units & all OSBL (Utilities &

Offsite) of the project including detailed engineering as defined above, which includes, but not limited to, Utilities and Offsites, interconnecting piping, adequacy check of existing pipe racks, overhead cable tray/Trench, IRC/ERC (Instrumentation Road Crossings/Electrical Road Crossings) etc. Preparation of bid Packages, Tendering (on E-tendering basis) / Tendering assistance, evaluation of bids & preparation of award recommendation of the same. Overall Project Management, Review & approval of Detailed Engineering and Drawings, Inspection & Expediting Services, Construction Management & Supervision, warehouse management for Free issue material (FIM), monitoring, IBR package preparation/ Coordination with GBI for obtaining IBR certification, Quality Assurance, Assistance in Start-up, Commissioning & Performance Test Runs for units /packages under this mode of Project (Licensed, Open Art units) and allied Utility & Offsite facilities at Mumbai Refinery.

Note: -

1. The BDEP, FEED, Prepared by Licensor / PMC for the licensed units & Open Art units, Utility & Offsite shall be handed over to the selected Consultant or if required by bidders during bidding stage after signing NDA.
2. This tender for EPCM services has been prepared to seek quote for the entire scope of Consultancy services at one go on single point responsibility.
3. The CONSULTANT shall be responsible for and shall manage all the battery limit interfaces of entire project between units / offsite / utilities/ Under Ground (UG) lines in liaison with different agencies/ contractors / Suppliers / Vendors/ Package contractors / OWNER / PMC/ Licensors.
4. In case, drawings/ datasheets of existing facility (equipment/ Pipe racks etc.) is not available, Consultant shall do the site Engineering based on site measurement to generate such data to meet the Project requirement. Consultant to include such service in their Lumpsum Engineering Fee (no separate payment on this account will be entertained by BPCL).
5. The CONSULTANT shall prepare the Project Implementation Strategy and implement the project on time. The implementation strategy should be based on their experience on the implementation of similar projects which are successfully completed as per schedule defined in the tender. Complete details of the same shall be furnished with the bid.
6. Consultant shall carry out adequacy checking of the existing Offsite facilities and revalidation of new facilities corresponding to the project requirement.
7. Utilities required for the facilities considered under this project will be reviewed and finalized by the Consultant. Integration of the new utility system with existing system of the Refinery shall be carried out by the Consultant under this project. Project facilities defined under Table-1 herein above will be finalized by the Consultant. Utilities requirement thus finalized shall meet the requirement of Basic Design Engineering Packages (as prepared by Licensors/ PMC) as minimum.
8. Augmentation of existing facilities/ new Utilities & Off-site (as per requirement) shall be carried out by consultant.
9. Adequacy checking of the existing ETP to meet the additional load of the total project. Consultant shall study additional requirements and shall do the detailed engineering and execution of the additional requirements.

10. Adequacy checking of existing Fire Water System to meet the additional load of the total project. Consultant shall study additional requirements and shall do the detailed engineering and site execution of the firefighting facilities.
11. Within India, Inspection will be in scope of consultant. For outside India, inspection will be done through TPI agency. Or if consultant is required to travel outside india for any compulsory inspection, same will be covered for reimbursement as per Price scheduled in the appendix 1 of SCC.
12. Control room / Substation infrastructure adequacy study shall be carried out for modification/revamp/additions in the existing facilities. Adequacy of field instruments including control valves shall be verified wherever modifications/revamp in existing units are proposed.
13. Complete designing, awarding of contracts and commissioning of main substations for BPCL-MR and basis including complete civil building works, HVAC, FA & building electrification.
14. **Modularization:** The Consultant shall work closely with design firms, contractors, and manufacturers to promote the integration of modular construction techniques during the entire lifecycle. Explore modular solutions for key components, ensuring standardized design and assembly processes, not limited to pipe racks, skids and prefab piping spools but across the asset class. Develop procurement strategies that align with Modular Construction principles, emphasizing prefabrication and off-site assembly. Engage with suppliers to ensure timely delivery of modular components with consistent quality. Set targets for the percentage of the project that will utilize modular construction along with OWNER. Monitor and report on the achievement of modularization goals, i.e., acceleration of project schedule over the baseline.

7.0 PROJECT MANAGEMENT ORGANISATION

- 7.1 CONSULTANT to plan, initiate, guide, coordinate, supervise and control the entire Project implementation activities through a dedicated task force consisting of specialists and experts on various aspects of the Project such as process design, engineering, contracts, purchase, planning & monitoring, expediting, meetings with vendors at various places, inspection, construction, commissioning etc. The task force will be headed by a dynamic and competent Project Manager with proven ability in managing such large projects.
- 7.2 The CONSULTANT will act as an extension of the OWNER, always keeping in view OWNER's interests and advising/ guiding OWNER on all important matters, to ensure that the Project is completed within cost, time and quality targets.
- 7.3 Mid-course changes are expensive and therefore, tendency for changes must be resisted, unless the selected design is unsafe, unworkable, uneconomical or as desired by OWNER.
- 7.4 All coordination and communications for the Project will be carried out under the overall guidance and control of CONSULTANT'S Project in charge. CONSULTANT will develop coordination and communication procedures soon after its appointment, in consultation with OWNER (BPCL).
- 7.5 CONSULTANT to note that all Tendering activities for the Project have to be done in E tendering mode as per BPCL philosophy.
- 7.6 Consultant for the Project will form a Documentation Control Cell. This Cell shall be responsible for all incoming and outgoing technical documents related to the project. These documents will be compiled as per agreed procedures, kept updated to the latest revision and delivered to the designated agency (ies).

- 7.7** Management of Inputs is key to successful Project implementation. CONSULTANT'S Project control and monitoring system will be based on management of inputs right at micro level. Computerized tracking system will be used to enable CONSULTANT's Project personnel to monitor timely availability of inputs at every stage from all agencies engaged in Project implementation.
- 7.8** The construction plan is to be backed up by a Procurement Plan and an Engineering Plan, which should offer maximum flexibility. It is therefore imperative that attention must be paid for the success of the Procurement and Construction Plan of Package and Conventional services, where the flexibility for minimizing time is low. This requires that the Procurement / Tendering procedure adopted by the package / conventional Contracts should be time-wise efficient. Further, the short list of vendors / site works contractors developed by the CONSULTANT in consultation with OWNER should include only such vendors who have proven performance track records
- 7.9** CONSULTANT should use a good Software package for material movement and contractors billing. Major Sub-contractors should be induced to set up their PCs in the construction Office so that the Contractors, CONSULTANT as well as OWNER can handle material movement and billing operation on PCs.
- 7.10** The material related activities are to be carried out on BPCL SAP system in line with the prevailing procedure/ practices of BPCL. In this regard, Consultant shall provide dedicated qualified manpower for the entire operation of the Project (at BPCL Site), the cost towards the same is deemed to be included in the CONSULTANT'S quoted Lumpsum prices. The job nature shall be of assistance in materials codification, creation of Purchase requisition in SAP, creating Purchase orders, receiving the materials in SAP (PO view, GR posting) etc.
- 7.11** Emphasis would be placed on mechanizing construction activities as much as possible. Therefore, the tenders/ contracts should specify such requirements.
- 7.12** CONSULTANT shall establish (if not already existing) a suitable communication system for electronic transfer of data & drawings among the Licensors, Process Designers, OWNER, Consultant and major Vendors/ Contractors for faster approval of drawings and decision-making.
- 7.13** Project Consultant shall provide office space & related office infrastructure facilities, like furniture, computer, telephone, internet connectivity etc. for OWNER's team (facilities for maximum 2 persons at each location) at CONSULTANT's Home/ Engineering Office. The cost towards the same is deemed to be included in the CONSULTANT's quoted Lumpsum prices.
- 7.14** Consultant shall provide list of Specialized Software Packages to be used for Project activities like Planning, Monitoring, Execution, Stores Management, Document Management etc. List to be submitted along with the bid.

Following is minimum expected:

- a. Primavera / MS Project Package
- b. Spool Management Software
- c. Stores Management Software
- d. Procurement & warehouse package

- 7.15** CONSULTANT shall establish a proper system for documentation for the entire project (including Licensor, Conventional / package contractor, other EPCM contractor etc.)-

Consultant shall endeavor to move towards digitalization, and all document transfers shall be based on soft form (hard copies may be generated as and when required). Consultant shall implement electronic document management system incorporating all necessary documents into the 3D model which would

be handed over to BPCL with proper indexation and document searching techniques / options on periodic basis/as requested by BPCL.

- 7.16** CONSULTANT shall establish a suitable communication system at site, as approved by OWNER. CONSULTANT, PACKAGEs and other major vendors are expected to transfer various documents/drawings electronically to save precious project time.
- 7.17** The CONSULTANT shall not be bidding for PACKAGE Contracts including Supply Contracts for this Project. The CONSULTANT shall not undertake any activity, which is to be performed directly/ indirectly by the Contractors/ Suppliers and is the direct/ indirect responsibility of the Contractors/ Suppliers.
- 7.18** CONSULTANT to appoint Project Manager for this Project. The minimum qualification:

Sr. No.	Category of Manpower	Qualification	Min. relevant Experience
1	Project Manager	Graduate Engineer	Total at least 25 years of experience out of which at least 15 Years in project execution and should have handled and successfully completed at least one project of similar nature in refinery / petrochemical industry.

- 7.19** CONSULTANT to deploy separate teams for “Activities which will be executed at Mumbai Refinery” during the services at Head Office.
- 7.20** CONSULTANT will deploy adequate manpower for each discipline wise exclusively at BPCL refinery site for project planning/co-ordination on daily basis from award of the job till completion of the contract. The requisite requirement of the manpower will be as per the manpower deployment chart given in Chapter- 4. Consultant to include such service in their Lump sum Engineering Fee (no separate payment on this account will be entertained by BPCL). Consultant shall submit the Planning Organogram to BPCL Planning for review and same shall be finalized in consultation with BPCL Planning.
- 7.21** CONSULTANT will be responsible for effective monitoring of all construction areas of the Project. 100% coverage of the jobs at construction site shall be provided by the CONSULTANT irrespective of working hours & number of CONSULTANT'S personnel required for the same. Accordingly, it will establish requisite site organization staffed by competent and experienced specialists. Requisite number of specialized personnel shall be provided to site, as per the ‘Minimum Manpower Deployment Chart for EPCM SERVICES at Site for PRFCCU and Associated services at MR mentioned in Chapter- 4.
- 7.22** Consultant Scope shall include for the design and engineering analysis required for any space creation, including modification or rerouting of existing piping, structural supports, and utility systems within the refinery.
- 7.23** Mobiles Phones are not allowed inside plant area, CONSULTANT to arrange intrinsically safe phones for the staff who are working in the plant area.

8.0 TIME OF COMPLETION

The time schedule is given below and detailed in SCC and Chapter-3 of 'Techno commercial documents.

The contractual completion of the entire project facilities of PRFCCU and associated units of Bharat Petroleum Corporation Limited, Mumbai Refinery including Mechanical completion and commissioning is 47 (forty-seven) months from date of award of contract/LOA (Letter of Acceptance) to the consultant.

PRFCCU and associated facilities shall be mechanically completed within 43 (forty-three) months from the date of issue of LOA/FOA or PO whichever is earlier to the consultant.

Commissioning of the units shall be completed within 4 (four) months from the date of Mechanical Completion.

CHAPTER-2**CONSULTANTS SCOPE OF WORK****1.0 SCOPE OF THE PROJECT**

- 1.1** The Scope of the Project facilities generally include but not limited to the facilities described under Chapter-1 and the tender document. The consultant shall be the Project Management Consultant for the Project as defined and its implementation in accordance with the Project Implementation Strategy given in this tender Document. Unless otherwise specifically agreed, as such, a Consultant shall perform and be responsible for the Performance of services as are necessary for or incidental to providing comprehensive project management, the Engineering, Procurement & Construction Management and associated services for the Project completion.
- 1.2** As already mentioned in the Tender all works for the successful completion and commissioning of PRFCCU at MR are deemed to be included in the scope of EPCM even if specifically, not mentioned in the Tender. The Project shall mean all the activities required for realization of the plant as detailed and envisaged after review, preparation/ Updation and obtaining of BDEP / FEED packages.
- 1.3** All the conditions, requirements, etc. stipulated by statutory authorities as part of the approvals/clearances / license issued by them should be implemented within the scope of the project.

Note: Detailed scope of EPCM services to be performed by the consultant under this contract is described henceforth in associated chapters and annexures of this tender. In some sections, the activities are repeated and may be similar while reading through. This is done only to bring more clarity to the scope of work to be performed in all phases of project execution. The consultant to note that all sections of this tender & the detailed scope of work activities shall be read in conjunction with each other.

2.0 PROJECT MANAGEMENT

CONSULTANT, during various phases of the Project, shall be responsible for total management of Project activities as explained in Chapter-2. The activities for the different project phases are explained separately.

Sr. No.	Annexure No.	Description
2.1	Annexure-I to Chapter 2	Consultant Scope of work Review / finalization of BDEP / FEED
2.2	Annexure-II A to Chapter 2	Consultant Scope of work for activities in EPCM / Conventional mode
2.3	Annexure-II B to Chapter 2	Consultant Scope of work for EPCM activities in Package Mode
2.4	Annexure-III to Chapter 2	Indicative contents of basic design & engineering package
2.5	Annexure-IV to Chapter 2	Guarantees of Open Art Units
2.6	Annexure-V to Chapter 2	List of project related documents required to be developed by CONSULTANT

2.1 Scope of Consultancy Services

Consultant shall perform general project management services for entire project such as:

- a. Overall project management execution plan
- b. Overall Risk & Cost Management
- c. Overall project system and procedures for all disciplines (Contracting, Procurement, Construction, HSSE, Quality, Project controls, Constructability studies, Value engineering etc.)
- d. Overall project controls & Change management
- e. Overall site management
- f. Digital solutions for overall packages

The services of Consultancy under this Contract include but not limited to the following:

2.2 Pre-construction enabling activities.

Study / assess the requirement of various enabling facilities and infrastructures within or outside the Project site essential for safe, smooth and timely implementation of the Project. The same should be compiled in the form of a report with justifications, pros and cons, estimates, etc. and the same shall be implemented after deliberation with the OWNER. Some of such enabling activities identified but not limited to:

- a. Survey of the area earmarked for PRFCCU and its associated facilities project.
- b. Constructability study including requirement and deployment of heavy lifting tools & tackles.
- c. Development of Hard stand for heavy lift equipment
- d. Site grading to desired level
- e. Construction/modification of new/existing road
- f. Instrumentation Road Crossing (IRC)/Electrical Road Crossing (ERC)
- g. Overall and unit-wise barricading
- h. Development of fabrication yards
- i. Development of area for material storage
- j. Relocation and modification of existing facilities including piping corridor for material / equipment movement
- k. Construction/modification of new/existing Drainage system,
- l. Development of distribution system for construction power & water, drinking water during construction
- m. Construction of sanitary & sewer system, worker shed at construction site
- n. Construction of site office for consultant/OWNER engineer
- o. Construction safety system for the entire project facilities.
- p. Over dimensional consignment (ODC) /Overweight consignment (OWC) route from possible receipt locations and storage at refinery site to be studied and implemented.

Adequacy study for existing firefighting system, recommendation, and implementation as per requirement for entire project facilities.

Study of Weather protection requirement for continuation of work during all-weather condition, High mast requirement for entire project facilities, recommendation and implementation.

Finalization of project procedures, project coordination plan, project execution plan, project electronic communication/IT system, project schedule, project resource plan, construction philosophy etc.

2.3 Development of Project Procedures & Reports

- a. Developing overall project management plan, project execution philosophy, Risk management plan and project coordination procedure.
- b. Consultant to prepare and submit detailed execution strategy for the entire project which shall be finalized after discussing with OWNER in line with "Implementation Strategy" mentioned in chapter -1.
- c. Preparation of procedures covering mechanical completion, pre-commissioning, commissioning, start-up, performance guarantee test runs (PGTR) for the Units and their takeover from the Package / composite / Site Contractors.
- d. Consultant is responsible for driving the execution of the technological interventions specified in Digital Section chapter and will be responsible for its integration and execution with the other contractors.
- e. Consultant shall compile and submit a project closure report, including comprehensive lessons learned, risk mitigation outcomes, deviation records, and improvement opportunities for future projects.

2.4 Planning & Control

2.4.1. CONSULTANT shall, in consultation with the OWNER, develop and provide a detailed planning and scheduling system to the OWNER covering all aspects, activities and inputs falling within and related to the CONSULTANT'S Scope of Work.

2.4.2. Such planning and scheduling systems cover the scheduled status of each function of the CONSULTANT and all functions and inputs of the CONSULTANT with respect to the contract including, but not limited to, the following:

- a. Services
- b. Engineering
- c. Procurement
- d. Fabrication
- e. Transportation
- f. Installation and construction
- g. Commissioning

2.4.3. Also, CONSULTANT as part of his scope for planning & monitoring the project shall provide / submit the following inputs / reports and carry out several activities as listed:

- a. Developing project scope and procedures for the entire project.

- b. Preparation of Network for the project and updating of the same by periodic evaluation and review. Identifying the critical activities and its close monitoring to adhere to the overall project schedule.
- c. Preparation of networks for EPCM / package mode jobs.
- d. Preparation of detailed networks, bar chart schedule covering all the activities concerned to be performed by CONSULTANT in keeping with the overall project schedule.
- e. Preparation of Master Project Schedule for mechanical completion, commissioning of the project including pre-project works.
- f. Preparation of Master planning document for the entire project and its regular Updation.
- g. Preparation of major milestones for the entire project.
- h. Developing an appropriate MIS covering monitoring, reporting, controlling, feedback, mid-term corrections. Assist OWNER in preparation of reports for Ministries.
- i. Organize & participate in regular project review meetings monthly at BPCL Site office/ Consultant office in India and daily/weekly at site or as required and submit monthly progress reports and daily / weekly / fortnightly flash reports on various Engineering/Procurement services & Site Services.
- j. Submission of regular Risk Analysis and Mitigation plan for the entire project.
- k. Suggest catch up plan to bring back the project on schedule, if delayed.
- l. Furnish weekly report of progress on catch up plan
- m. Catch up plan for delayed activities
- n. Updation of Level-3 schedule two times during the course of project without changing the end date shall be required.
- o. Consultant has to give the overall progress status of package items in the monthly progress report.
- p. Consultant has to show the revised quantity after engineering of each contract in a separate column in the weekly construction report. The progress figure has to be calculated based on the updated figures.
- q. Progress shall be monitored for overall project progress & also progress on critical path. The projected completion date of the project based on critical path shall be mentioned clearly along with the gaps/delays.
- r. Level 1 to Level 5 schedule of the project with clear demarcation of the critical path shall be prepared. Package contractor schedules (Level 3 to Level 5 schedule) shall be reviewed and superimposed.
- s. The Level 5 schedule needs to be reviewed and monitored on a regular basis and should form a part of the monthly progress report.
- t. Consultant shall make action plan/catch up plan/look ahead for these activities so as to ensure project completion on time.
- u. The Level 3, level 4 and level 5 schedules shall be made in software (Primavera and/or MS project) and all the data related to monitoring reports/curve/dashboards shall be updated in the software on periodic basis. All the backup data made by EPCM shall be shared with BPCL.

- v. **Dashboard reporting:** Consultant shall configure dashboard for reporting to top management the status of the project in consultation with BPCL planning. This dashboard reporting shall be in form of a password protected software/app which can be installed in both laptop and mobile (IOS and Android).
- w. Consultant shall prepare & monitor the material status report. EPCM shall also prepare & monitor the status of long lead as well as critical items separately and identify items which may affect overall project completion/progress.
- x. Consultant shall monitor and generate report on the status of ordering and delivery of bulk materials fortnightly.
- y. Consultant shall endeavor to move towards digitalization, and all document transfers shall be based on soft form (hard copies may be generated as and when required).
- z. Consultant shall implement electronic document management system incorporating all necessary documents into the 3D model which would be handed over to BPCL with proper indexation and document searching techniques / options on periodic basis/as requested by BPCL.
- aa. OWNER intends Consultant to prepare and submit 4D models (3D models with time axis) and shall update, review and monitor the model on monthly basis.
- bb. Consultant shall also monitor the project from financial perspective and would generate MIS based on:
 - **Commitment curve:** A scheduled commitment curve shall be finalized for the entire project, and the actual curve shall be updated on a monthly basis.
 - **Expenditure Curve:** Consultant shall make scheduled expenditure curve for entire project cycle and actuals shall be updated on a monthly basis.
 - Consultant shall monitor the cash outflow of BPCL every month and also project the cash flow over the next 3 quarters so that necessary actions can be taken to ensure unhindered cash flow.
 - **Physical vs financial progress of the contracts:** Physical & financial progress shall be monitored and reported every month for all the contracts indicating the action items for reducing the gap.
 - **Cost Status Report:** Consultant shall provide a detailed cost status report incorporating estimate & actual deviation, projected project cost at completion etc. on Monthly basis.

2.4.4. The list of deliverables for planning & monitoring of the project is as follows:

Consultant shall finalize, submit, review & monitor periodically (as mentioned) the following KPIs. All the data in the reports shall be in graphical/statistical form clearly indicating the focus areas/concern areas /areas requiring attention and projected completion date for the activity/overall project. All the activities which are delayed and require attention shall be indicated by red. The reports as per MIS mentioned below are minimum requirements and Consultant shall improvise / provide additional reports as required for the project from time to time.

2.5 Management Information System (MIS) Reports

The following reports are regularly compiled and issued for Management information. These reports are mentioned elsewhere in the bid document; however, if any other reports are required, Consultant will

generate and issue the same with no additional cost to OWNER. Apart from the usual reporting parameters, Financial S Curves, 3 months look ahead schedule on progress, planned work quantities, commitment / expenditure etc. are also to be included

Sr No	Name of Report	Periodicity	Remarks
Engineering			
1	Vendor Drawing Approval Status	Fortnightly	Include documents pending with consultant
2	Packager Drawing issued for Construction	Fortnightly	
3	Status of Bulk Materials -P&ID, AFC Drawing wise	Fortnightly	Report should contain minimum required quantity per AFC wise, Action taken (PR, PO, Receipt, etc.). Action for balance quantity should be given.
4	Hold Ups Report	Monthly	
5	3D Modelling Status	Monthly	
6	Risk Analysis & Mitigation Plan	Monthly	Flag Major backlog contributors
Procurement			
1	Status of Material Requisitions	Fortnightly	It should give the no of MR, Action taken details like RFQ, PO Recommendation, etc.
2	Inspection & expediting Reports	Monthly	The Report shall be generated on Purchase Order wise & Vendor wise separately.
3	Material Status Report	Monthly	To include dispatch status
4	Material Receipt Status- Item wise/PO Wise	Monthly	Include material in Transit status
5	Risk Analysis & Mitigation Plan	Monthly	Flag Major backlog contributors
Construction			
1	Construction Report including materials Receipt	Daily	DPR/ Weekly
2	QC/QA	Monthly	
3	Construction Audit Report	Quarterly	
4	Punch List liquidation Report	Weekly	Pre-commissioning / commissioning status
5	Risk Analysis & Mitigation Plan	Monthly	Flag Major backlog contributors

Sr No	Name of Report	Periodicity	Remarks
6	HSSE report	Monthly	
7	Look Ahead schedule	Monthly	
8	Sub-Contracting status Report	Monthly	
General			
1	Project Progress Report	Monthly	To include manpower & Machinery deployment
2	Cost Status Report	Monthly	
3	Status of Outstanding Documents from Licensor/EPCM	Monthly	
4	Change Orders Status Report	Monthly	
5	Hold Ups Report	Monthly	Include for HO & Site
6	Project Milestones Report	Monthly	Current Plus 2 months ahead
7	Invoicing Status	Monthly	
8	Discussion notes of Co-ordination meetings with other consultants/ vendors/Package/ Works Contractors	Monthly	
9	Overall Risk Management Plan for the project & periodic review status till completion of the project.	Quarterly	

2.6 Consultant will prepare a Planning & Monitoring Dossier at project closeout, including all schedules, reports, dashboards, and lessons learned.

2.7 Consultant may also provide earned value analysis (EVA) metrics including SPI, CPI, and forecasted completion dates in each monthly report.

2.8 Consultant shall prepare formats for the above-mentioned reports and get them approved by BPCL. The formats shall be evolved/improvised from time to time as per the need of the project and feedback from BPCL.

2.9 Development of Project Procedures

- a. Developing overall project execution philosophy and project coordination procedure.
- b. Preparation of procedures covering mechanical completion, pre-commissioning, commissioning, start-up, performance test runs for the Units.

2.10 Project Quality Assurance

2.10.1. CONSULTANT shall perform the following Quality Assurance & Quality Control activities:

- a. Preparation of Overall generic Quality Assurance and Quality Control (QA/QC) System for the various phases of the Project (i.e. Engineering, Procurement, Construction and Commissioning).
- b. Overall QA/QC plan for the project
- c. QA/QC procedures for common equipment & bulk materials
- d. Keeping regular surveillance and audit the Quality Assurance Program of Package and other contractors and vendors and ensure its implementation.
- e. Preparing and updating QA/QC report for the entire project on a regular basis identifying areas for corrective action by concerned agencies
- f. Preparing detailed scope for stages of inspection till final completion for all procurement items viz. equipment and bulk materials.

2.10.2. In order to achieve superior QA during all stages of construction, CONSULTANT besides carrying out strict monitoring as per drawn up QA plan, should undertake measures to identify & liquidate problem w.r.t. mix up of various material such as piping, flanges, joints etc., with particular emphasis to High pressure & High temperature section for the entire project. Use of modern gadgets like positive material identification (PMI), Torque wrenches etc. have to be ensured for this purpose.

2.11 Monitoring, Coordination & Supervision of Conventional Contractors and package contractors, CONSULTANT, as Engineer-in-Charge of the Contractors shall perform the following activities:

- a. Establishing of project control system to control, monitor and report to the OWNER for all Contractors.
- b. Providing an effective, continuous liaison and control both at site and design office of the contractors to ensure prevention of slippage in project schedule.
- c. Monitoring of all contractors' various activities particularly focusing on purchase, expediting & inspection and suggesting corrective actions thereof.
- d. Supervision and co-ordination of all Contractors' activities viz. planning, organizing, controlling, monitoring.
- e. Define clear and unambiguous boundary limit conditions for all the Contractors.
- f. Co-ordinate, liaison with all the Contractors to ensure no overlaps or left out activities in the total project work.
- g. Close follow up/ expediting of delivery of critical equipment.
- h. Ensuring compliance for Wage/attendance of labors, labor payments and PF/ ESI challans etc.
- i. Certifying all the Contractor's documents, invoices, bills of-the supplies and/or works as the case may be to enable the OWNER to release the payment to all the Contractors as per respective billing schedule.

2.12 Liaisoning with PMO:

2.12.1. BPCL may intends to set up a Project Management Office (PMO) – an external consultant which will act as an extended arm of BPCL's management for planning & monitoring of the project. The PMO will work along with the BPCL project execution team, BPCL Planning team, Consultant and contractors to plan the project including packages, monitor progress, identify and highlight issues, monitor risks etc.

- 2.12.2.** Consultant along with execution shall coordinate and assist the PMO consultant in all aspects of project progress (both physical & financial) planning, monitoring & reporting. In addition to the regular progress reports, Consultant / execution contractors shall provide additional input / data as may be directly requested by PMO/ PMO consultant on project progress from time to time to independently monitor project progress keeping BPCL in the loop.
- 2.12.3.** Consultant shall provide access to its Primavera and/or MS Project schedules and monthly progress reports. EPCM shall also provide all details pertaining to drawings and engineering schedules and Long Lead Items progress as may be under its scope. Consultant shall ensure vendor updates to BPCL and its appointed PMO. The PMO may also independently verify project progress through interaction with Vendors or its subcontractors.
- 2.12.4.** PMO may also interface directly with consultant and seek information regarding schedule, basis of monthly progress reports etc. PMO can make suggestions regarding weightages of schedule or request for feeding of data in any IT system (meant for dash boarding).
- 2.12.5.** For computation of financial progress, Consultant and the Contractors shall prepare baseline Level 3 schedule and provide costing for each of the activities in Primavera and/or MS Project to enable tracking of physical and financial progress in Primavera and/or MS Project.

2.13 Project Cost Control

CONSULTANT shall undertake:

- a. Cost budgeting, expenditure profile and forecasting for the entire project.
- b. Preparation of detailed cost estimate for each procurement/ contract in consultation with the OWNER and as per approved Tendering/ Purchase Procedure of OWNER.
- c. Preparation of report highlighting planned expenditure profile vis-a-vis actual expenditure on an annual basis for budgetary control purposes of the OWNER.
- d. Preparation of cost status reports including cash flow analysis on monthly basis.
- e. Furnish the Completion Report of the Project to OWNER to further take up as per statutory guidelines including Department of Public Enterprises (DPE) for justification of following information.
 - i. Final project cost variations from approved project cost estimates and justifications for the same.
 - ii. Delays in completion schedule and reasons for the same.

2.14 Archives Management

CONSULTANT shall undertake management of archives including proper documentation, listing, indexing and updation of all documents/drawings under the project etc. CONSULTANT shall furnish the documents for approval/ for records as illustrated in Conditions of Contract elsewhere.

- a. All project documentation shall be as per BPCL specification for handover of Engineering Information.
- b. Electrical - Intelligent single line and circuit diagrams shall be created in COMOS format.
- c. Instrumentation - Intelligent Instrumentation diagrams / hookup diagrams / instrument loop wiring etc., shall be created in COMOS platform / Smart Plant Instrument (SPI).

- d. P&IDs, PFDs and Interactive Operating manual, it may be specified that it is to be created in COMOS format.
- e. All as built P&IDs and Piping layouts/piping plans to be in AutoCAD DWG format. (Auto CAD P&ID not required if we are implementing intelligent P&ID for this project).
- f. As built 3D model files and the library files shall be delivered to BPCL. The structure and format of the library and data files shall be agreed at the start of the project / before creation.
- g. Master MR & PR list to be provided by CONSULTANT
- h. Unit wise MR to be prepared by CONSULTANT for Bulk Materials
- i. For uploading documents into our Engineering Document Management System (EDMS), the soft copies of documents being submitted by the Consultant / Vendors / Contractors have to be as per the following norms.
 - All documents shall be submitted with an index file in excel format containing the Document Number, Document title, tag Number, filename/ file path, and which will be finalized during Kick-off meeting with successful bidder.
 - For soft copies Multiple documents shall not be clubbed as a single file
 - Filenames shall be unique and shall not contain special characters.
 - Any design or maintenance document that refers to a single item of Equipment, Tag or Model shall be delivered as a single file (e.g. 2 data sheets for 2 pump tags shall not be delivered in a single file).
 - Final documentation shall be delivered as native electronic files. If PDF rendition of documents is permitted, PDF files shall be rendered directly from the authoring application to preserve image quality and embedded text. Images shall be rendered in an orientation that allows viewing without rotation.

All vendors/contractors are to be asked to submit all documents strictly on the above lines.
- j. All equipment data shall be provided in SAP and Meridium format (Format will be given by BPCL). This shall be part of all Package contractors also. In addition to this, we require the following lists in excel format.
 - Equipment list
 - Line Index / line list
 - Instrument index, including alarm, trip settings and point database.
 - Electrical load list
 - Master document index
- k. Tag number philosophy shall be finalized during design basis and this shall be part of all package contractors. CONSULTANT shall ensure that the tag number is available on As-built documents and on Equipment also.
- l. Corrosion Control Document (CCD) shall be prepared by CONSULTANT for all process units and Risk Based Inspection (RBI) data to be provided in BPCL format.

2.15 Dashboard reporting:

Consultant shall configure dashboard for reporting to senior management / Ministry Monitoring about the progress status of the project in consultation with BPCL project planning. This dashboard reporting shall be in form of a password protected software/app which can be installed in both laptop and mobile (iOS and Android). Consultant should drive the following aspects of execution via contractors and include these elements in the relevant contracts for contractors or drive them directly, wherever applicable. They must provide tracking mechanisms by adding a layer of dashboards. The selection between cloud-based and on-premises hosting for digital solutions shall be determined on a case-by-case basis, taking into consideration project requirements during execution. The final decision on the hosting solution will be made by BPCL after careful consideration of the project needs. The Ownership and licenses of the proposed solutions will be transferred to BPCL during the works and prior to commencing design. Consultant shall configure a dashboard (Control Tower) covering the following aspects:

Establish an integrated project management system, serving as the central hub for all project-related information. Utilize advanced Digital Project management solutions to enable real-time monitoring and control of all project activities, including those being performed off-site.

Digital project management solutions should include an interactive dashboard (Power BI/ Tableau equivalent), along with data information management system that collect real-time information from multiple sources (e.g., Primavera for project schedule, ERP for contracts administration, EDMS system for documents submission status, BIM, etc.)

Facilitate weekly discussion with project stakeholders through virtual meetings, updates, and shared digital platforms. Establish clear protocols for error resolution, minimizing delays and cost implications. Leverage analytics for proactive issue resolution. Establish benchmarks in discussion with BPCL for issue resolution and actively work to reduce the time taken to address challenges. Measure and report on the efficiency of issue resolution processes.

Integrate contractors into the Control Tower approach, ensuring alignment with project goals and timelines. Provide training and resources to contractors for seamless collaboration within the project framework.

Set up Key Performance Indicators (KPIs) (e.g., site progress against plans, actual/planned/projected cash flows, manpower deployment on site, quality & safety NCR, etc.) to monitor progress in real-time across all project phases. Regularly analyze and report on project performance through digital dashboards against established benchmarks.

Digital project management tools will have to be within the options described in Table given below. The Consultant can suggest preferences, but the final decision lies with the OWNER. The solutions should be compatible and need to integrate with CDE (common data environment) and control tower. Provide training sessions to ensure proficiency for the tools.

Table - Proposed Digital Project Management Tools

Use Case	Type of Solution	Suggested solutions
Control Tower (CT)	Dashboard	PowerBI
		Tableau
		Customizable SaaS solutions
EDMS (OWNER defined)	EDMS	Bentley

Use Case	Type of Solution	Suggested solutions
		Aconex
		HxGN SDx
		Aveva
3D Model/ BIM (OWNER defined)	3D BIM software	Bentley
		Intergraph
		Aveva
		Autodesk (except AutoCAD)
Real-time availability of yard-wise inventory & in-transit	WMS	SAP EWM
		Oracle WMS
	TMS	SAP TM
		Oracle TM
Digital Safety Management system	Safety protocols monitoring	Open - depending on base platform provider
Quality	Base platform	Autodesk (except AutoCAD)
		Trimble
		Procore
		Bentley
Automated system for manpower and machine productivity	Deployment and Productivity monitoring software	System compatible with chosen CDE, CT
	Biometrics, RFID, IoT sensors	System compatible with chosen CDE, CT
Digital Planning and Scheduling	Planning Software	Primavera

2.16 Organization Structure of Consultant

The organization structure of CONSULTANT personnel to be deployed for the work should be in line with Special Conditions of Contract and Chapter-4 of Technical Scope of Work document.

2.17 HEALTH, SAFETY & ENVIRONMENT

- Consultant shall develop comprehensive specification for Health, Safety & Environment protection and the same is to be made part of all bids.
- Consultant is responsible for ensuring adherence of all safety requirements by consultant personnel as well as contractors.
- Consultant shall depute full time Safety officer(s) and site engineer as per requirement of contract conditions at Site to check and ensure the safety requirements during all phases of construction on “round the clock basis.”

- d. Consultant shall incorporate proper Construction Safety Clauses imbibing stringent penalty for all contractors in the various tenders and any safety lapse on the part of contractor shall lead to imposition of such penalty on Contractor. Relevant Clauses to be included in the construction contractor tender.
- e. Consultant shall analyze the reasons for all the Safety Violation/s resulting in Near Miss/ Lost Time/ First Aid/ Recordable/ Reportable/Fatal Accidents and submit its findings to the OWNER within 24 hours along with its recommendations to avoid such incidents in future.
- f. Consultant shall ensure that entire project site & all ongoing construction activities are under CCTV surveillance until Mechanical Completion (MC) /start of pre commissioning activities. Consultant shall set up a centralized monitoring control room at site with round the clock monitoring. Remote monitoring/viewing of CCTV content shall be provided to OWNER. Consultant shall penalize erring contractors based on evidence of recorded CCTV footage.

2.17.2. Requirement for Independent Monitoring of Project by OWNER:

OWNER may intend to have the total progress of project monitored independently through third party. Consultant to give all necessary data to this third-party monitoring agency including getting data from OMC, Contractors, Vendors, Suppliers etc.

2.18 General points in the scope of consultant and items to be taken care by the consultant

1. Supply and fabrication Piping scope inside the battery limit of Major Rotary equipment to be avoided (Engineering of piping to the nozzles of rotary equipment to be in the Consultant 's scope). Only interconnecting piping between their system only be considered.
2. All structural fabrication inside India at Fabrication shops shall be in scope of CONSULTANT.
3. Number of MTOs to be restricted and almost 80% to 90% of material to be covered by second model review (60%) and balance by final model review.
4. Heavy lift cranes to be clubbed considering the total requirement and a coordinator from CONSULTANT to be assigned specifically for heavy lifts.
5. Consultant to ensure space optimization considering usage of cranes by multiple contractors at the same time.
6. The cost estimate of CONSULTANT should be based on latest Maharashtra labor rates.
7. Mobilizations of new machineries and implementation of latest technologies in construction for speedy completion is to be mentioned in the tender.
8. In the package contracts, CONSULTANT has to give the proper soil investigation data. Any amendments to the contract have to be with BPCL approval.
9. Work Hindrance registers need to be maintained by CONSULTANT for all contractors with signatures of all stakeholders.
10. Working in monsoon/ rainy seasons and their precautionary measures similar to dry season are to be mentioned in the tender.
11. CONSULTANT should deploy separate team for resolving Issues related with public, labor camp issues, canteen etc. in connection with project activities are to be taken care for smooth progress.

12. Incorporate Energy Conservation Philosophy considerations in Equipment Design & Equipment Selection (type of equipment/type of drive (steam vs electrical), minimize steam consumption, include equipment efficiency in vendor selection etc. Commercial evaluation of all equipment should be based not only on L1 criteria but equipment efficiency and overall Cost of Ownership of equipment to OWNER.
13. Alternative models / types / Latest designs & energy efficiency to be considered in equipment selection.
14. HSE Management during Construction. Suitable training module covering all levels of Engineers of CONSULTANT / BPCL& Contractors and senior management of Contractors to be provided.
15. 3-D Modeling integrating U/G structures/Piping, Above Ground Equipment including Packages and outside CONSULTANT scope to identify fouling.
16. Scope includes for Conventional mode: 3-D Modeling includes preliminary which is of draft initial mode with no structure review. Whereas 3D model review of, 30%, 60% and 90% will be having structure model review at consultant office / BPCL – MR office.
17. Scope includes For Package mode: 3-D Modeling includes preliminary which is of draft initial mode with no structure review. Whereas 3D model review of, 30%, 60% and 90% will be having structure model review at consultant office / BPCL – MR office.
18. Review of existing Design basis, Procurement /Tendering Procedures of OWNER for improvement/increased competition.
19. Review of Rejection Criteria for offers for better competition.
20. Conduct detailed route survey and identify site fabrication/equipment dimensional limits before Detail Engineering (Monorail / Metro rail / Fly Overs etc. to be considered).
21. Overall responsibility for piping/auxiliary system/connected system- design based on specific equipment supplier requirements like pulsation study/anti-surge requirements etc. for compressors.
22. Support make in India: Review capability of Indian manufacturing units/subsidiaries when parent company is ready to give guarantee.
23. Review of Licensor recommended items/vendor lists for increased competition.
24. Evolve a reliable system for review of PTR.
25. Identification/Design of Work Packages with suitable mobilization requirements to meet the site-specific conditions and Project schedule.
26. Identification of Infrastructure requirements for the Project implementation.
27. Field Engineering/commissioning Support: Critical Checks: Pre-commissioning audit by an independent CONSULTANT expert team, checks on critical supports/spring support loading/mounting/critical safety settings etc. This expert pre commissioning team from the consultant shall have representation from all disciplines like process, technology, inspection, mechanical, rotary, instrumentation, civil, electrical & piping. The pre commissioning audit shall be as per latest prevailing OISD norms but not limited to it.
28. Modern online monitoring systems for corrosion, vibration, noise or other critical process parameters.

29. Consider latest developments in corrosion protection paints/coatings /insulation designs/metallurgy etc.
30. Review and identify acceptance check points for critical equipment.
31. Design of suitable drainages/roads/fabrication yards etc. considering heavy monsoon and monsoon protection during construction.
32. Design and implement of modular constructions to minimize site works with latest modularization technologies.
33. Planning Heavy Lifts/Crane requirements.
34. Cost optimization through value engineering.
35. Adequacy check of existing facilities that will be connected or hooked upto New facilities.
36. Submission of design calculations of pressure vessels and storage tanks to BPCL after certification by CONSULTANT.
37. The processing units shall operate without interruption for minimum run length of four years. Consultant shall ensure that a comprehensive corrosion study of each process unit is conducted involving domain experts and a corrosion monitoring and controlling system is implemented along with commissioning of the units.
38. Design and construction data of static equipment (columns, reactors, vessels, exchangers, safety valves, and tanks) need to be captured in an editable format enabling OWNER to upload the data into the SAP system. The template for data collection will be given by the OWNER.
39. A flange integrity management system shall be ensured by the consultant where by all flanges in critical circuits are identified, and joint integrity is ensured through proper designing and controlling of activities during erection and commissioning.
40. Consultant shall ensure that consolidated unit wise list of spring supports and bellows along with their design data are made available in soft copies to the OWNER.
41. Safety insulations are not permitted for piping and equipment. Instead, protection guards shall be provided. Consultant shall develop required standard documents for safety guards and ensure the same is implemented.
42. Condition Monitoring Equipment:
 - i. Consultant shall procure condition monitoring equipment.
 - ii. Consultant shall ensure that remote vibration monitoring data collection facility is provided for all (a) Bearings of cooling tower fans & gear boxes of the same, (b) Bearings of air fin coolers and motors of the same etc.
 - iii. Consultant shall note that remote greasing facility is also provided for all (a) Bearings of cooling tower fans & gear boxes of the same, (b) Bearings of air fin coolers and motors of the same etc.
43. Consultant shall ensure that spares interchangeability report shall be submitted.
44. Maintenance Tools up to commissioning and stable operation of the plant:
 - i. CONSULTANT is to ensure that all tools & tackles up to commissioning and stable operation of the plant: shall be the responsibility of the respective contractors, Consultant to ensure the availability of the same.

- ii. On award of the work to contractors, they will submit such list of tools & tackles which will be reviewed & approved by CONSULTANT. The approved copy will be sent to OWNER for their comments. Any comments from the OWNER shall be binding to contractors.
- 45. Systems & Loops within the Units/ Facilities: Consultant shall ensure the submission of the following documents reviewed by them, at least six months in advance before the MC for review & approval of OWNER:
 - i. Segregation & submission of the system within the unit which will be used during system flushing.
 - ii. Segregation & submission of hydro-testing loops within a system which will be used during hydro testing.

Consultant shall note that all comments of OWNER shall be binding on both package contractors, conventional contractors & Consultant.
- 46. Hook-up/ Tie-in Points: Consultant shall submit the hook up / tie up schedule within 12 months after award of EPCM/Package contracts / Conventional contracts.
- 47. Catalyst Loading: Consultant shall note that they will review the instruction of Licensor for catalyst loading, handling procedure & systems and ensure that the same is complying by contractors.
- 48. Post Warranty Maintenance Services:
 - i. Consultant is to note that during warranty period of any equipment / instruments / facilities, rectifications (not normal maintenance), if any, are to be done by the respective OEMs. However, Consultant is to identify all critical instrumentations / equipment / facilities for which specialized assistance services from OEM & will be required immediately after commissioning of the project. Till PGTR, all coordination is to be done by contractor / Consultant including cost thereof in line with the Special condition of contract.
 - ii. Consultant is also to note that the concept of per diem rate is to be introduced for each & every equipment / instrument and the same will be operated beyond PGTR & warranty period (whichever is earlier), if required.
 - iii. Consultant to note that 5 years Comprehensive AMC shall be considered for all the Analyzer Systems. For DCS system, 4 years of extended warrantee along with 5 years AMC shall be considered after completion of standard warranty period.
 - iv. Consultant to note that for special flow meters, Tank Radars 3 years of extended warrantee shall be considered after completion of standard warranty period.
 - v. Consultant also has to note that rate for annual maintenance contract is also to be frozen for a period of five years after commissioning & expiry of warranty period. In general, warranty period shall be expired after a period of 12 months from the date of commissioning.

49. Sub-contracting by Package Contractors:

Consultant shall develop a system for maintaining various sub-contracting done by main Package contractors and monthly MIS is to be submitted to OWNER for the same.

50. Work Permit System:

- i. Within the construction area and at all locations where work is to be executed for project completion, Package contractors, all site executing contractors & Consultant shall follow BPCL Work permit system (WPS) without any deviation.
- ii. Work permit system for all hook up / tie up jobs and within operational area shall be as per enforced work permit system of BPCL without any deviation.

51. Handing Over of Completed System:

Consultant shall note that handing over of a system shall only be done after thorough check of the system which will be in five consecutive stages by contractors, Consultant & OWNER. A suitable procedure is to be developed by consultant along with Package contractors which will be submitted to OWNER for acceptance. Any change in the same by OWNER shall be binding on the Consultant & contractors.

52. Mobilization Plan:

- i. Consultant shall submit their mobilization plan and also obtain, review & approve mobilization plan of contractors and for all other contractors. All these will be submitted to OWNER for their final approval. Comments / requirements of OWNER shall be binding on CONSULTANT & Package contractors / all other contractors
- ii. Mobilization plan must be area wise, discipline wise and package wise both for Consultant & Package contractors / all other contractors.

53. Commissioning data submission of Rotary Equipment

Consultant shall develop a suitable format for collection & submission of base line data for rotary equipment during pre-commissioning, test run & final commissioning which will include (a) Vibration, (b) Bearing temperature, (c) Sound level, (d) Spike energy, (e) Flow during test run, (f) Pressure during test run, (g) Flow on commissioning, (f) Pressure on commissioning etc. The format shall be decided on having discussion with CONSULTANT, Package Contractor, Conventional contractor & OWNER.

54. Construction Water:

Contractors shall bring water for construction purpose and all necessary actions for the same shall be in the scope of respective Contractors. Water from the OWNER is subject to availability and shall be on a chargeable basis

55. Electrical load Study:

Consultant shall note that they shall carry out electrical load studies, i.e., load flow, short circuit analysis, transient stability, Motor starting, adequacy check etc. and power system protection coordination study of the complex after completion of detailed engineering and finalization of all electrical loads in the project. Consultant shall take action to liquidate actions arising out of the electrical load / protection coordination study, if any, Consultant shall carry out relay co-ordination studies to ensure stability of the entire refinery electrical system during starting of large rating motors etc. Necessary changes in existing load shedding & islanding schemes (hardware & software) and associated settings of the LSIL relays shall be provided as part of the report.

56. Consumables e.g. Lube Oil etc:

Consultant shall note that they will give the list of all consumables required for the various facilities, at least six months in advance, to be procured by OWNER along with quantities & technical / detailed specifications. 'BPCL make' suitable grade of lube oil for rotary equipment is to be considered to the extent possible.

Note: The above requirements are only indicative.

However, consultant to review and provide all necessary infrastructure facilities to complete the entire project activities till satisfactory performance guarantee test run of the entire project facilities without any financial liabilities to the OWNER.

57. Modularization:

The Consultant shall work closely with design firms, contractors, and manufacturers to promote the integration of modular construction techniques during the entire lifecycle. Explore modular solutions for key components, ensuring standardized design and assembly processes, not limited to pipe racks, skids and prefab piping spools but across the asset class.

Develop procurement strategies that align with Modular Construction principles, emphasizing prefabrication and off-site assembly. Engage with suppliers to ensure timely delivery of modular components of consistent quality.

Set targets for the percentage of the project that will utilize modular construction along with OWNER. Monitor and report on the achievement of modularization goals, i.e., acceleration of project schedule over the baseline.

To enhance safety and productivity, optimize available plot space and reduce timeline for the Project, constructability of the unit using latest modular design construction to the extent possible may be adopted for the project. Availability Plot space can be utilized to set up the facilities and facilitate the modular design of construction. It is recommended to make provisions for pre-assembled pipe racks, pipe spool fabrication, steel assemblies (e.g. ladders, staircases, platforms etc.), pre-cast concrete at the shop. Pipe racks shall be fabricated at vendors shop and painted except the final coat. Only touch up paint and final coat shall be provided at site.

Consultant to hold a constructability review during early detailed design engineering phase so that any potential construction hazards can be identified and addressed in time. Considering monsoon season from June to September, civil and infrastructure work, especially road and drainage, cable trench needs to be planned in a manner so that the impact on the site work is minimized. Construction planning should also consider the lessons from previously executed projects in BPCL refineries and address them through appropriate proactive measures.

ANNEXURE-I**CONSULTANT SCOPE OF WORK REVIEW / FINALIZATION THE BDEP / FEED****1.0 SCOPE OF WORK**

The services of Consultancy under this Contract include but are not limited to the following:

- 1.1** Finalization for the Process and engineering design basis for all the disciplines including Piping Material Specification (PMS) and Valve Material Specification (VMS). If some licensors, insist on following their specific PMS / VMS, CONSULTANT will convert/merge licensor specific PMS/VMS into the requirements specific to Client.
- 1.2** Review, Updation, preparation and Finalization of the BDEP (For PRFCC and other open art units, Utility and Offsite for Mumbai): Broad activities including co-ordination and management with licensors, PMC, OWNER and attending requisite meetings for BDEP - Design Basis/PFD/P&ID/Data Sheets (including the review of Licensor BDEP for ensuring its completeness & consistency) as detailed below:
 - a. Design Basis finalization / Updation including filling up the Basic Engineering Design Questionnaires (BEDQ) that will be submitted by the respective Licensors.
 - b. Review and Finalization of guarantees, liabilities, schedule of deliverables at BDEP Stage, liaising with selected licensors.
 - c. Arrange & participate along with BPCL in review meetings as necessary
 - d. Conduct P&ID review of Licensed unit, Open art unit and Utilities & offsites with all the stake holders at consultant / OWNER office.
 - e. Review / Update / Finalization of Piping Material Specifications (PMS) for the Project.
 - f. Review / Update / Finalization of Engineering Specifications for the project
 - g. Review of Heat and Material Balances, Process Flow Diagrams, equipment layout and Material Selection Diagrams. Finalize plot plan suiting the existing plot.
 - h. Review of Piping and Instrumentation Diagram (P&ID) including Logic Diagrams, mechanical design drawings and Equipment Data Sheets.
 - i. BDEP submitted by the Licensors / PMC to be closely reviewed at all stages. Ensure all the inputs and comments of the Consultant / Client are incorporated & check for completeness & consistency.
 - j. Co-ordination with OWNER and licensors / PMC for completion of process packages as per schedule.
 - k. Facilitating the agreements with licensors (including Guarantees, liabilities, etc.)
- 1.3** If licensors, PMC, OWNER provide their standard Process Design Package, BDEP, FEED package, CONSULTANT shall convert the Package into the requirements of Client specific Basic Design Engineering Package, using BPCL's standards and numbering system for executing the project in EPCM / Package mode Consultant shall carry out residual Updation of Process Packages, BDEP, FEED for open art units (new and revamp), utilities, off sites and any other facilities required obtained from the OWNER / Licensor / PMC during preparation of BDEP for Licensed units. Also, CONSULTANT shall review and finalize guarantees and liabilities for the open art units (new/revamp) and utility & offsites performance.

- 1.4 Residual Updation / preparation / finalization of Adequacy check of existing utilities and offsite systems at Mumbai Refinery to be carried out by CONSULTANT for arriving at new requirement of utility and offsites, Provide updated adequacy study report with recommendations for new facilities, if any.
- 1.5 Review / Preparation / finalization of overall plot plan and optimized layout for the process units and other project facilities viz., SRR control room at Admin and cooling tower facilities in line with relevant OISD/CCOE norms. Updation of existing plot plan as necessary. In this regard, care to be taken to minimize the risk factors/safety hazards for new units and to the existing Refinery.
- 1.6 Milestone based schedule for the CONSULTANT activities and overall project schedule, identifying critical path and priority activities. Provide detailed implementation plan facility wise with bar chart.
- 1.7 Documents and technical support to the OWNER for obtaining statutory and other approvals required for construction of the project facilities such as consent to establish from MPCB, etc. and assistance for any other statutory approvals as deemed fit.
- 1.8 Integration of utilities and other systems within the complex and with the refinery for achieving efficiency in operations and cost reduction in project cost. Preparation of process connectivity/ integration packages for i) new facilities as a complex ii) new facilities integrated with existing facilities.
- 1.9 Identification of tie in points for piping to/from the project facilities/refinery for routing of feedstock, products, utilities & off-sites, effluent streams, blow down streams, condensates etc.
- 1.10 Design conditions and efficiencies should match global standards. Consultant shall specify and finalize all the guarantees including process guarantees & liabilities of the open art units and Utilities & Off sites.
- 1.11 To consider and incorporate major features necessary to ensure the safety of the plant and personnel and will take into consideration local and international standards pertinent to pollution & environmental control, including effluents & solid waste, atmospheric emission and noise control.
- 1.12 CONSULTANT is required to enter into requisite NDA with the licensors / PMC and / or BPCL, as required.
- 1.13 CONSULTANT shall represent, warrant and agree that in the execution and performance of this PROJECT, it will comply with any and all applicable laws.
- 1.14 CONSULTANT shall develop and install a suitable communication system for transfer of various documents / drawings electronically/ through E-mail/ internet among CONSULTANT and OWNER. This clause pertains to establishing Communication and coordination procedures. For the purpose of document transfer Consultant shall use EDMS system as detailed in the tender document and give access to BPCL.
- 1.15 Consultant to ensure through electronic communication system a proper co-ordination & fool proof linkage between, their Head Quarter, OWNER's Head Quarter for effective flow of documents/ drawings and or information.
- 1.16 Concurrent engineering: Participation of consultant along with OWNER during BDEP preparation right from KOM, P&ID review, finalization of plot plan, hydraulics & equipment data sheets etc. for Licensed Units. Association with the process Licensors, PMC, OWNER for finalizing Basic Design Engineering Packages of all the licensed units, Open Art units including review of P&IDs & Process Packages under their scope. Completeness of information in Process Packages, BDEP, FEED to be ensured by consultant.

- 1.17** Review and finalization of BDEP of licensed units, Open Art Units and Utilities & Offsites.
- 1.18** Development of Scope of Project, location plan, Equipment layout and facility planning. Consultant to visit the site and acquaint themselves with the site conditions. Actual site data to be taken by consultant for offsite/ utilities and tie ins etc.
- 1.19** Planning & control including development of Work Break-down Structure (WBS).
- 1.20** Revamp of Existing unit: These revamp jobs will be executed on EPCM mode. All the battery limits/ hook up points to be defined by the Consultant in the Tender. Proper integration of these revamped units with other Process units and the resolution of interface related issues shall be the responsibility of the Consultant under this contract. Any changes at battery limit conditions/ interface points (during execution) shall be executed by consultant without any time & cost implication.
- 1.21** Residual Design & Engineering and Updation / preparation of BDEP / FEED for Licensed Units with associated Off-site Tankages, storage, Utilities at Mumbai Refinery
- 1.22** Residual Design & Engineering and detailed engineering for Open Art Process Units (like SWS, ARU etc. with associated Off-site Tankages, storage, Utilities at Mumbai Refinery).
- 1.23** Assistance for Risk Assessment Study including RRS / QRA Study for the total project. Same shall be done by consultant
- 1.24** Preparation of contract for Site Data, site(s) meteorological data, earthquake/seismic survey reports. If any for detailing.
- 1.25** Master communication document and data control.
- 1.26** Interface management with Licensor & other third parties: Interface management philosophy to be finalized by consultant in consultation with OWNER.
- 1.27** Assistance in obtaining Environmental clearance amendment for the total project.
Assistance of Consultant includes:
 - a. Preparation of necessary documents required for obtaining various approvals,
 - b. Consultant shall accompany with OWNER to submit all the necessary documents to statutory authority and also prepare & make presentation, if required, to be given to statutory authorities etc.
- 1.28** To review the Constructability study along with ODC route study carried out by OWNER and Updation of Constructability / ODC route study from possible receipt locations perspective is in the Consultant Scope
- 1.29** Finalization of project procedures, Project coordination plan, project execution plan, project electronic communication/IT system, project schedule, project resource plan
- 1.30** Preparation, review, Updation & finalization of Plot Plan and equipment layout based on licensors input and norms (OISD).
- 1.31** Conduct HAZOP HAZID (Hazard Identification)/PHSSER (Project HSSE Review study) etc.
- 1.32** Consultant shall also assess the requirement of Construction Power and Water and line up agency for both.
- 1.33** Scope of Work for Open art unit and Utility & offsite for activity is attached as Exhibit-A.
- 1.34** Detailed scope of work for Review, update and finalization of FEED prepared for Licensed unit activity is attached as Exhibit- B.

- 1.35** Updation / Preparation of BDEP/Customization of FEED package with revalidation / rechecking with respect to Mumbai refinery conditions along with the Process performance guarantee.
- 1.36** Consultant scope includes lining up of additional contracts as per site requirements and BPCL's advice, based on actual progress and emerging needs. This shall be done without any additional financial implication to BPCL.
- 1.37** Consultant shall coordinate with vendors and ensure all necessary arrangements are made for unloading equipment at site before dispatching the material from vendor works. They must also coordinate with CISF and BPCL for smooth vehicular entry. It is EPCM's responsibility to ensure there is no traffic disruption in the refinery and public inconvenience in surrounding Mumbai roads due to poor coordination.
- 1.38** Consultant shall compile and submit a project closure report, including comprehensive lessons learned, risk mitigation outcomes, deviation records, and improvement opportunities for future projects.
- 1.39** Consultant shall ensure that all incoming project materials undergo PMI testing as per applicable specifications. Complete records and traceability documents shall be maintained and submitted to BPCL upon request.
- 1.40** The Consultant will submit a comprehensive document containing as minimum covering the following but not limited to:
- a. Updation of equipment list including new, modified & deleted equipment
 - b. Review of Adequacy and consistency of Licensor's / PMC / OWNER's BDEP Package and incorporation of modifications identified for Revamp.
 - c. Adequacy check for existing pipe racks, existing foundations for new loads, modified equipment, addition of new platform including strengthening and support.
 - d. Checking Hydraulics calculations for all lines in Process units and Offsites.
 - e. Updating of existing P&IDs for all sections and mark-up P&ID's relevant to the project scope.
 - f. Review, Update, Prepare and Finalize the BDEP / FEED package for the Project including tie-ins with refinery/ utility integration with the refinery. The BDEP / FEED should consist of all the incoming and outgoing streams and their B/L conditions.
 - g. Formulate the project plan and its philosophy.
 - h. Review the documents and list out the information available
 - i. Identify the information required. Information not available with BPCL to be generated by consultant by site visit.
 - j. Updation of the design basis document
 - k. Preliminary HAZOP study for all units / facilities.
 - l. Finalizing Tie-in's and interface requirement.
 - m. Residual adequacy checks for utility and power requirement
 - n. Site visit for study of modification and constructability review.
 - o. Updating of electrical single line diagram based on revised load list, electrical area classification, main electrical cable routing, conceptual substation layout.

- p. Work out the additional/new requirement of HV/LV switch gear panels for additional loads and availability of space for revamped units.
- q. Safety requirements during construction in running plant.
- r. Finalization of Erection work, shutdown activities and determining the shutdown period
- s. Updation & Finalization of Master schedule, Project procedures and project execution plan.
- t. Estimation of operating cost

EXHIBIT-A**CONSULTANT'S SCOPE OF WORK FOR OPEN ART UNIT AND UTILITY & OFFSITE**

CONSULTANT shall perform services for the PROJECT, the scope of which is as explained in this document for Project Management, preparation of Process Packages other than licensed units, Residual process design/ engineering, Integration of new facilities and Refinery facilities wherever possible, Hazop studies of all facilities, Detailed Engineering.

Licensor / PMC has carried out the activities pertaining to the preparation of process packages other than licensed units, Residual process design / engineering with the consistency checks. Now the project shall be executed on EPCM / Package mode. Accordingly, the Review, Updation, preparation and finalizing the complete document including removal of 'Hold' as applicable in coordination with the Licensor / OWNER / PMC shall be in the scope of consultant. The obtained BDEP / Process Packages shall be segregated and converted into the document required for EPCM / Package mode of execution.

CONSULTANT to note that the BDEP format / scope will be licensors / PMC specific and it is expected that the scope under Residual Design and Engineering will be based on the available details in the BDEP of the various open art units and Utility & offsite facilities for completion of entire project.

Consultant Scope shall also include checking the BDEP / process packages / in all respects and any incompleteness / missing information or in circumstances where the Consultant challenging the work carried out by PMC / OWNER shall be listed out and same shall be carried out by Consultant's without any extra cost for residual design and detailed engineering thereafter to ensure completeness before going to the market for selection of vendor and contractor.

General Notes: -

- a. Ensuring uninterrupted progress, continuity and smooth & seamless integration of jobs to achieve targeted overall project schedule, cost and quality of implementation.
- b. Activities involved with co-ordination and management with licensors during residual process engineering/detailed engineering
- c. Residual Process design / extended design for licensed units, offsite & Utilities.
- d. Documents and technical support to the OWNER for obtaining statutory and other approvals required for construction and operation of NEW FACILITIES Local statutory approval (TAC- Tariff Advisory committee) Approval) on fire protection system for process units, utilities and offsite facilities of NEW FACILITIES shall be obtained by OWNER and required support for documentation is be provided by the Consultant.
- e. FEED for licensed units and Detailed Engineering for Open Art units/Utility & offsites and interconnection facilities.
- f. HAZOP / HAZIP / SIL Study for the individual process units, offsites and utilities. The existing refinery is excluded from the HAZOP study. However, HAZOP / HAZID / SIL study of all interconnections of utilities & offsites from Refinery to NEW FACILITIES are included.
- g. Detailed engineering for all the other envisaged facilities.
- h. Integration of all the units for sharing of Utilities and process streams.

- i. Integration and optimization of utilities and other systems within the complex and with the refinery for achieving efficiency in operations and cost reduction in project cost.
- j. Standardization of Process Design Package (PDP) and PFD / P & ID's, if required, of process units, utilities & offsite to meet requirements of BPCL.
- k. Development and installation of a suitable communication system for transfer of various documents/ drawings electronically/ through E-mail/ internet among CONSULTANT and OWNER.
- l. Scheduling for the project, overall project schedule for NEW FACILITIES, identifying critical path, milestones and priority activities, breaking down for the purpose of monitoring.
- m. Project monitoring, Cost & Time reporting for all the activities covered under the scope of this contract.
- n. To consider and incorporate major features necessary to ensure the safety of the plant and personnel and will take into consideration local and international standards pertinent to pollution & environmental control, including effluents & solid waste, atmospheric emission and noise control.
- o. Plan, initiate, guide, coordinate, supervise and control the entire activities through a team of specialists and experts on various aspects of the project.
- p. Design conditions and efficiencies should match global standards.
- q. All the conditions, requirements, etc. stipulated by statutory authorities as part of the approvals/clearances / license issued by them should be implemented within the scope of the project / EPCM consultant.
- r. P&ID shall be developed as intelligent P&ID by the consultant. Intelligent P&ID shall have navigation feature to PDMS 3D MODEL software and vice versa.
- s. Wherever possible energy saving measures like VFD, PRT etc. are to be included during Detailed Engineering. Energy savings details are to be provided in such cases.
- t. Reduction of Green House Gas (GHG) to be given top priority and total reduction in GHG emissions to be captured through various measures adopted and to be reported. Each recommendation should mention about GHG and energy savings measures and if applicable, the same should be quantified.

1.0 REVIEW AND FINALIZATION OF PROCESS PACKAGES

Consultant shall review update and finalize process packages for Open art unit and other associated facilities as per the scope in **Annexure-III**.

Consultant shall update / prepare the Process packages in such a way to carry out the detail engineering.

2.0 RESIDUAL PROCESS ENGINEERING

2.1 CONSULTANT shall review and update the process package for Process Unit & Associated Facilities and carry out residual process engineering for the same, incorporating all the changes proposed under the CONTRACT. This shall include Process and Instrumentation Diagram (P&ID), Equipment list with data sheets,

Instrument list with data sheets including sizes and type. Updated documents will be reviewed by the OWNER and comments shall be incorporated.

2.2 Consultant shall also ensure compliance of all other conditions of Environmental Clearance & NOC.

- 2.3** CONSULTANT shall review and update Unit equipment layout after residual process design and Engineering/ vendor inputs as applicable.
- 2.4** CONSULTANT shall also perform a preliminary Hazop (timeframe will be decided later) and the detailed HAZOP study with the participation of BPCL engineers / representatives after completion of detailed engineering and receipt of vendor inputs and implement the HAZOP study recommendations after BPCL's approval.
- 2.5** CONSULTANT shall furnish Instrument Data Sheets for listing all numbered instruments appearing on the P&I Diagrams and covering all process requirements. Soft copy of all instrumentation documents shall be submitted in editable for loading into purchaser's documentation node. Consultant shall generate and submit all instrument specifications, data sheet using smart plant instrumentation of latest software version.
- 2.6** CONSULTANT shall prepare utility Summaries showing connected, normal and maximum load of steam condensate, fuel, water, power and other utilities. In addition, Block Flow Diagrams for steam, condensate and de-mineralized water for the Units shall be prepared. These are subject to refinement during Detailed Engineering.
- 2.7** CONSULTANT shall prepare Preliminary Electrical Load summary, listing all power consumption/ consumers.
- 2.8** CONSULTANT shall prepare effluent/summary containing the flow and critical specifications of various process effluents.
- 2.9** CONSULTANT shall issue the revised documents such as P&IDs, Data Sheets etc. to OWNER for their review and approval.
- 2.10** Review and Update ISBL utility distribution P&ID's including, Flare, Inert Gas, BFW, Condensate and underground system, etc. The same will be reviewed by the OWNER before finalization.
- 2.11** Review and Updation of the following after completion of detailed engineering.
 - a. Process Data Sheets for Equipment.
 - b. Instrument Data Sheets, Control Philosophy, Cause effect matrix for interlocks, Detail datasheet & design specifications for DCS/ESD systems, Instrumentation index, Instrumentation earthing philosophy, Instrumentation material selection philosophy
 - c. line lists & all utility figures.
 - d. Compilation of all the updated utility system P& IDs (Cooling Water, IA/PA, N2 System, ETP/ as per of final Utility Package Documentation).
 - e. Preparation of Plant specific Operating Manuals & Maintenance Manual.
- 2.12** CONSULTANT shall perform Review and Finalization of the following process design/ process engineering services for Process Facilities and Offsites/ Utilities:
 - a. Process Flow Diagrams including flow diagrams for all off-sites and Utilities showing, numbered process flows, process temperatures and pressures in equipment and piping at all stages of process, critical control elements and qualities/composition of streams.
 - b. Heat and Material Balance listing all the numbered process flows on Process Flow Diagrams and showing the normal composition and conditions of each stream.
 - c. Equipment list (giving item number & description) and specification.

- d. Supervisory operating Manual sufficient for start-up operation and shutdown and suitable for expansion into detailed instructions.
- e. Piping and Instrumentation Diagrams giving:
 - i. Complete piping and instrumentation including hook-ups for all Process units and offsite/ utility piping for start-up, bypass, shutdown and emergencies etc. including inert Nitrogen blanketing requirements.
 - ii. Line Specifications/ line schedule including sizes, materials of construction and code numbers, rating,
 - iii. Instrumentation control loops including any sequences or emergency shutdown requirements.
 - iv. Control valve and relief valve sizing, types and response on air failure.
 - v. Evaluation of equipment wherever they are critical for the process.
 - vi. P&ID furnished in the process package should incorporate complete Cause and Effect diagram for the whole Process units that gives an overall view of the Safety related interlocks with SIL rating for each interlock.

2.13 EQUIPMENT DATA SHEETS

These data sheets are required to initiate mechanical design and specifications. These data sheets shall be prepared for each piece of equipment and cover process requirement. Tanks, Vessels, Cooling Water System, Chilled water system, Lean air system, Online and emergency Inhibitor dosing systems, Emergency cooling systems, Raw Water System, Plant Air/ Instrument Air system, Nitrogen distribution System, Wastewater System, Fire Fighting System, Steam & Power System, Flare System, Columns, Exchanger, Heater, DM plant, Pumps, Compressors, Bullet, etc. shall be covered by a Sketch and Tabular Specification. Other equipment shall be covered by tabular specifications only. In general, the data sheets shall indicate:

- a. Type and capacity
- b. Skeleton Drawings showing fundamental construction and main dimension including all internals.
- c. Operating pressure, temperature and other conditions.
- d. Design pressure, temperature and other conditions
- e. Material(s) of construction
- f. Corrosion Allowance(s)
- g. Insulation and/or refractory lining(s)
- h. Details of all internals required

2.14 Instrument Data Sheets for listing all numbered instruments appearing on the P&IDs Diagrams and covering all process requirements.

2.15 Utility summaries showing connected, normal and maximum load of steam condensate, fuel, water, power and other utilities shall be furnished. In addition, Block Flow Diagrams for steam, condensate and demineralized water shall be prepared. These are subject to refinement during detailed engineering.

2.16 Preliminary Electrical Load summary, listing all power consumption/ consumers including single line diagrams.

- 2.17** Effluent summary containing the flow and critical specifications of various process effluents (for the entire project).
- 2.18** Equipment layout plan (covering various requisites).
- 2.19** Equipment data shall be submitted in soft copy in Excel as per the SAP / Meridium Format. The format (data required) for each type of equipment (Rotary, Static, Electrical and Instrument) will be given to the consultant by the OWNER.
- 2.20** Detailed scope of work for BDEP is listed below:

Review, Update and Finalization of Basic Design Engineering Package with the following content:

- a. Design basis
- b. Heat & Material balance (stream summary)
- c. PFDs
- d. P&IDs (Construction and dismantling)
- e. Equipment datasheets
- f. Instrument datasheet
- g. Cause and effect diagram, Basic Control Philosophy
- h. Line schedule
- i. Piping material specifications
- j. Utility balance and summary
- k. Equipment layout
- l. Flare load summary
- m. Operating Manual
- n. Adequacy check report

All the above shall be made for all the design cases. For check case, heat and material balance and process flow diagram will be made.

2.21 Study Methodology & Deliverables

Following shall be Activities/ Deliverables for the preparation of Basic design Package

- a. The design basis will consist of the following information:
 - i. Plant definition including function and scope of the unit.
 - ii. Plant capacity, turndown rate and on-stream hours/year.
 - iii. Feedstock source and specifications, highlighting limiting specifications impact on unit design.
 - iv. Products and desired target specifications.
 - v. Utility sources and characteristics.
 - vi. Battery Limit Conditions
 - vii. Environmental requirements.

- viii. Safety requirements.
- ix. Specific design criteria and basis of selecting critical parameters.
- x. Codes and standards followed.
- xi. Special BPCL requirements, if any.
- xii. Site location and infrastructure requirements.
- xiii. Meteorological conditions.
- xiv. Schedule of deliverables including advance release of critical equipment data.
- xv. Coordination procedures.

- b. Preparation of Basic Design Package: This document will provide necessary process and engineering design information to enable Detailed Engineering, Design, Procurement and Construction.

3.0 QUALITY CONTROL:

- 3.1 Prepare Overall Quality Assurance and Quality Control (QA/QC) System for the various phases of the Project i.e. Engineering, Procurement, Construction and Commissioning)
- 3.2 Keep regular surveillance and audit Quality Assurance Program of contractors and vendors.
- 3.3 Prepare QA/QC Report (this includes NCR/Deviation raised and settled during the engineering, procurement and construction phases) for the project on a regular basis identifying areas of correction

4.0 INFRASTRUCTURE/PRE-PROJECT PHASE

- 4.1 Facilitate and Review site meteorological data, earthquake/seismic survey reports, preliminary soil report and other data as available. The Consultant shall identify additional data required and initiate actions for obtaining the same including preparation of tender document, recommendation of contractor and supervision of contractor.
- 4.2 Provide estimate of construction power and water.
- 4.3 Carry out basic engineering, design and execution of complete construction water and construction power distribution schemes from the point source at site identified by BPCL within the refinery.
- 4.4 Estimate requirement of infrastructure/construction enabling facilities for the project and initiate action for their execution through contractors. This would include preparation of plans, specifications, material requisitions/tender enquiries, evaluation of bids and recommendations to BPCL.

5.0 HAZOP STUDY:

The Consultant shall:

- 5.1 Undertake HAZOP study of all the units and offsite/utilities.
- 5.2 Undertake HAZOP Study of all Packages.
- 5.3 Undertake HAZOP review for the tie-in points along with connected facilities in offsite.
- 5.4 Update all P&IDs incorporating HAZOP recommendations.
- 5.5 Make HAZOP study report covering all details of HAZOP study including recommendations.

5.6 Prepare 'Close-out Report' before commissioning giving action taken on HAZOP recommendations.

6.0 DETAILED ENGINEERING:

The information required under this section but not limited to is to arrive at Detailed Engineering. Consultant to note that detailed subsequent detailed engineering is to be carried out as per **Annexure-IIA&B** for completion of the project.

Information (such as Piping, Electrical, Instrumentation etc.) required to do Detailed Engineering shall be discussed and finalized at the Kickoff Meeting with the successful bidder. As the bidder is expected to be fully involved with the BDEP process, the required information shall be available to do Detailed Engineering, Residual Engineering etc. CONSULTANT shall perform the following detailed engineering work:

6.1 PLOT PLAN:

CONSULTANT shall review and modify unit plot plan to suite best engineering practices, OISD and other statutory norms and issue the same for OWNER'S comments and approval. CONSULTANT shall incorporate changes, if required. The plot plan of existing refinery and the refinery expansion project shall be provided to the successful bidder.

6.2 DETAILING OF PIPING & INSTRUMENT FLOW DIAGRAMS:

CONSULTANT shall verify and update during the detailed Engineering phase, utility requirements, sizes of pipes, etc. of P&ID with Smart Plant P&ID (SPPID). All details pertaining to auxiliary piping, instruments, electrical interlocks, manholes, equipment, vents and drains etc. which are associated with specialized equipment that cannot be determined prior to the purchase of the equipment shall be added by CONSULTANT during the detailed engineering phase.

6.3 Provide circuit-wise flushing scheme for all facilities engineered by CONSULTANT.

6.4 Consultant shall use PDMS and other design and engineering software for preparing detailed engineering works. This includes all items such as tanks, towers, surge drums, separators, pressure filters, accumulators, columns and strippers, silos, agitators, RTO's, Incinerator waste, PRESSURE VESSELS AND OTHER FABRICATED

Equipment, Reactors (Autoclave) and pipe reactors etc. either shop fabricated or erected at site. CONSULTANT'S scope of work in this connection shall be as follows:

- a. Preparation of mechanical design in accordance with various Codes, to suit the Process Operating conditions. This will include calculations of wall thickness, thermal and mechanical stresses and design of internals, attachments etc.
- b. Material specifications and corrosion allowance.
- c. Preparation of fabrication specifications for purchase.
- d. Certain equipment and systems can be considered as package systems/ units. Detailed Engineering for such units/ systems will be carried out by the vendor/ manufacturer.

6.5 CONSULTANT'S responsibility shall in general include the following:

- a. Develop Package requirements/ Specifications.
- b. Analyse, tabulate & recommend proper package systems.
- c. Recommend and assist in proper selection of such package systems.

- d. API/TEMA data sheet for all equipment shall be provided by EPCM viz heater, pressure vessel, exchanger, flare, relief valve, compressor, pump etc. including for the equipment supplied by package contractor (in excel and pdf format)
- e. Fractionator simulation files/HETP simulation files, Orifice Plate/ Control Valve Sizing design files / Piping and Pressure Vessel Stress analysis files shall be provided to BPCL in native format by EPCM.
- f. Consultant shall arrange to provide intelligent P&ID, and interactive operating and maintenance manual for all process unit, utility & offsite
- g. Consultant shall identify the list of spares required for two-year operations and shall finalize the same after discussing with OWNER
- h. Protection guard shall be used in lieu of insulation for all piping/equipment (only for personnel safety)
- i. Color coding of process streams pipeline to be discussed and finalized in consultation with OWNER.
- j. All Painting applied shall have a guarantee for 5 years except for tank external and internal painting. For tank external and internal painting, 10-year guarantee shall be available. EPCM to ensure the same including the quality of paint application.
- k. U tube exchanger shall be avoided in cooling water service
- l. All P&ID, PFD, MFD (Material Flow Diagram) given by Process Licensor / PMC shall be updated by consultant and shall be given to OWNER. This is also applicable for units, where Consultant is doing the design.

6.6 HEAT AND MASS TRANSFER EQUIPMENT

1. HEAT EXCHANGERS

- a. Prepare design basis
- b. Thermal Design, Tube layout
- c. Mechanical Design to suit the process operating conditions.

2. FURNACE/HEATER

- a. Prepare Thermal Design and API Data Sheet and data sheet of auxiliaries.

3. TRAYS

- a. Finalization of Hydraulic & mechanical data of trays to suit process operating condition except those supplied as part of process package by Licensor. Designing of Trays for which vendor has proprietary design shall be done by the vendor.
- b. Guidelines for preparation of complete support ring and bolting bar, distributors, sprayers, draw offs etc. detailed layout drawings.

4. MECHANICAL AND ROTATING EQUIPMENT

This includes all rotary and static equipment

- a. Prepare Engineering design basis
- b. Preparation of general specifications as per API standards.
- c. Carrying out mechanical design and stress analysis, where applicable.

- d. Preparation of detailed specifications for inviting quotations/ tenders, sketches and data sheets to be prepared wherever required.

6.7 PIPING

CONSULTANT shall develop detailed plot plans fixing the coordinates and elevations of all equipment, outlining the requirement of structures and platforms, determining the routing of all buried and above ground pipelines electrical and instrument cable routing and will carry out the detailed engineering of the complete system. The scope will cover the following:

- a. Piping layout drawings with true-to-scale representation of all runs, fittings, valves, expansion loops, etc. taking site measurement if existing drawings are not available.
- b. Stress calculation, flexibility analysis and freezing of configuration.
- c. Detailed specification of insulation and steam tracing requirements.
- d. Design of supports, anchors, expansion loops hangers, etc. including special equipment supports
- e. Preparation of line schedules giving terminal details and operating conditions and test pressure.
- f. Preparation of detailed material take off e.g. valves, pipe lengths, fittings, spools, flanges, gaskets etc.
- g. Material specifications for pipes, fittings, flanges, valves, gasket etc. The CONSULTANT shall study all the Licensor(s) PMS and bring out a common PMS in consultation with OWNER.
- h. Issue of purchase specifications covering all piping elements required for the project.
- i. Carry out identification of hook-ups and preparation of hook-up drawings/sketc.hes. For process streams, tie in points to be shown in the P&ID and actual location to be decided during Detail Engineering. For utilities, tie in points to be decided after adequacy check by the Consultant.

6.8 PRESSURE VESSELS:(Includes storage tanks, vessels, columns/towers, surge drums, separators, mixers, filters, strippers, reactors, accumulators etc.)

The Consultant shall

- a. Prepare Engineering design basis
- b. Carry out mechanical design in accordance with various codes to suit process operating conditions

6.9 PACKAGE EQUIPMENT:

The Consultant shall

- a. Prepare specification of package equipment

6.10 PLANT FIRE DETECTION SYSTEM:

The consultant shall ensure design of fire protection systems like fire detection and alarm, fire suppression system in compliance with relevant NFPA codes and standards. The Consultant shall specify plant fire detection and alarm system to detect fire at the earliest and to give alarm so that appropriate action may be taken. This will include manual call points in & around plant area and associated buildings and smoke detectors in associated buildings such as substation building, control room and satellite / instrument rack room. Indications to be provided in both control room as well as fire station.

6.11 FIREPROOFING, INSULATION AND PAINTING

CONSULTANT shall prepare specifications for insulation and Painting and detailed estimate requirements of quantities and incorporate the necessary.

6.12 INSTRUMENTATION

This work shall include the following activities based on P & I Diagrams with proper tag name philosophy as per ISA/ relevant standards, design basis provided by OWNER and include preparation of Instrument Index considering all types of field Instruments including field switches, pressure gauges and temperature gauges and thermo-wells etc. Preparation of Loop Schematic for all open and closed loops considering DCS, PLC, (FF / NFF) Smart field transmitters, Analyzers, etc. showing the Tag nos. for each scheme. This shall also include details like type of IS barriers, relays, isolators etc. Complete loop summary shall be prepared including loop counts of various categories for each sub-unit shall be arrived. Detailed I/O listing on Tag nos. including digital points & serial I/O tags shall be prepared. Based on these, Instrumentation philosophy for field and control room instrumentation shall be finalized/ prepared.

Scope will also cover the following:

- a. Preparation of Loop Schematic Diagrams of all control loops with detailed explanation for complex loops including interlock scheme/ ladder logic involved.
- b. Design and preparation of complete specifications of various component items of all control loops, e.g. Control valves, Shutdown valves, safety valves, transmitters, flowmeters, controllers, signaling systems, interlocking and tripping systems, level gauges, pressure gauges, thermocouple/ thermowells, MCMS, Control panels, Analyzers, leak detectors, CCTV, cables etc. and material requisitions.
- c. Layout of instruments, tubing, electrical wiring and air supply.
- d. Preparation of instruments schedules giving complete bill of materials for items such as temperature, level and pressure gauges, solenoid valves, transmitter, controllers, recorders, control valves, pressure regulators, air filters, multi-core cables, single pair cables, JB's, Cable glands, erection material, tubing, fitting, tubing rack and supports.
- e. Preparation of location drawing showing position of all instruments having air or electrical connections and layout of instrument air and electrical cable routing.
- f. Developing control room arrangement drawings, cable schedule & JB Schedule.
- g. Preparation of instrumentation hook up sketches showing installation details with list of all materials required for all types of instruments specified.
- h. Preparation of instrument installation specifications for erection with Schedule of quantities. The special conditions & instructions to Contractor to carry out instrumentation erection job shall be also prepared.
- i. All above activities shall be carried out with relevant approvals from OWNER at all stages. Complete documentation and updation of the same whenever required including the final as-built drawings in both hard & soft copies.
- j. All design/ documentation work shall be carried out with the aid of computers with relevant package. This shall also include design/documentation work for Instrument items in SMART

Plant Instrumentation (SPI) format and same shall be submitted to the OWNER for loading into their LAN/WAN.

- k. All types of stack/ ambient analysers along with their integration, test and calibration instruments necessary for commissioning & maintenance.
- l. Details such as preliminary CCTV System Architecture drawing in order to finalize no. of cameras, no. of monitors, no. of system installations required etc. shall be finalized subsequent to award of job to the successful consultant.
- m. The scope shall include:
 - i. Consultant shall develop an Engineering design basis/Job specification/ Construction procedure document in consultation with OWNER to ensure uniformity of system design for all process units.
 - ii. CONSULTANT to develop PMS (PIPING MATERIAL SPECIFICATION) & VMS (VALVE MATERIAL SPECIFICATION) of the project.
 - iii. Consultant is required to participate in all technical review meetings/ kickoff meetings/system design review meetings, etc. of all critical instrumentation items like DCS/PLC/Analyzers/ Special hydraulic valves, control valves, on-off valves / Local Control Panels, control-on-off valves/transmitters, etc.
 - iv. Preparation of cable duct/tray layout drawing including fireproofing arrangement.
 - v. Preparation of cable trench drawing near control room building /plant area, etc.
 - vi. Preparation of CCTV drawing for control room /field area
 - vii. Preparation of fire-protection arrangement (clean agent)/ fire alarm system for control room & field area.
 - viii. Preparation of earthing / MCT frame lay out plan of field & control room area.
 - ix. Preparation of HVAC /Lighting/communication equipment layout plan. Communication equipment layout plan shall include Plant communication system (PA/PAGING) of control room & field area for Process units and Utilities, telecommunications systems (telephones) for Process units, Utilities and Offsites area including associated control rooms/SRR's/Sub stations, etc.
 - x. Preparation /review/approval of instrument air layout plan.
 - xi. Preparation/review/approval of gas detection layout of plant area.
 - xii. Preparation/review/approval of I/O point database, instrument index, level sketch, etc.& all other engineering documents related to field & control room instrumentation.
 - xiii. Preparation/review/approval of DCS and PLC system I/O point database for package vendor items, shut down and control logic diagrams based on P&ID Cause and Effect diagram.
 - xiv. Preparation of steam tracing layout of plant area for instruments.
- n. All instruments with their tag numbers for all operating modes of the unit including start-up, shutdown and emergency situations. Signals traversing between P&IDs as well as at battery limits will bear flagged connecting arrow- boxes.

- o. All instruments are required from a process standpoint on utility lines to individual process consumers. Definition of a process service is defined for piping.
- p. Instrument number, instrument designation as per ISA, insulation/ tracing requirements for all instruments. Instrument numbering philosophy shall be as per OWNER's system. All instrument P&ID symbols shall follow ISA symbols.
- q. Control loops and instruments for proper and safe operation.
- r. Size and air failure position of control valves. Type of control valve manifold either in the P&ID itself or as a legend referring to a specific table of valve size vis-a-vis manifold valve sizes to be followed.
- s. Clear identification of all hardware and software instruments both in field and in control room, philosophy of automated trips and start-ups, alarms, etc.
- t. Set pressure and recommended size of pressure relief valves.
- u. OWNER's philosophy towards use of single tapping points for multiple instruments, permitted use of a transmitter signal for both monitoring and interlocking, etc. shall be adopted after review.
- v. The consultant to obtain the preliminary SIL assessment report and recommendations from the Licensor if available. In addition, the consultant is responsible for conducting a comprehensive risk assessment for all new units and packages, taking into account interfaces with existing facilities and associated risks, to determine the required Safety Integrity Levels (SIL).
- w. Based on the determined SIL requirements, the consultant shall perform detailed SIL calculations and select appropriate instrumentation and components to achieve the target safety levels for each Safety Instrumented Function (SIF). A practical and acceptable proof test interval shall also be considered during the SIL determination process.
- x. It is the consultant's responsibility to ensure the complete design and implementation of the required SIFs, ensuring that all associated risks are reduced to a level below the tolerable threshold.
- y. INSTRUMENT DATA SHEETS: Process data sheets for all instruments covering all instrument loops (open or closed and field or control room) indicating main components, operating conditions, special conditions, etc. Instrument list with process data (tag no., min. Value, low and high alarm limits, engineering units) shall be supplied in the package. Each control valve, safety valve and analyzer will be specified on an instrument process data sheet. The ultimate instrument design conditions shall be verified and confirmed by detailed engineering contractor during project implementation phase.
- z. For the specific types of instruments, following minimum information shall be provided in the Instrument Data Sheet:
 - i. CONTROL VALVES:
 Tag number, location, flow rates (minimum, normal and maximum), sizing pressure drop, density and viscosity for liquids, molecular weight and compressibility factor for gases, whether liquid is congealing, operating & mechanical design conditions, air failure position, control valve size, mechanical limit stops (if applicable), spring action, smart positioners (FF / NFF), etc.
 - ii. SHUTDOWN VALVES

Tag number, location, operating & mechanical design conditions, air failure position, mechanical limit stops (if applicable), action, quick opening/closing requirement (if applicable), leakage class, limit switch requirement (if applicable), etc. Partial Stroke Test (PST) function shall be considered for critical/identified Shutdown valves.

iii. SAFETY/ RELIEF VALVES

Tag number, location, sizing flow rates, set pressure, operating & relieving conditions, allowable over pressure, density and viscosity for liquids, molecular weight and compressibility factor for gases, whether liquid is congealing, estimated valve size (to be finalized by detailed engineering contractor), etc. In the case of flashing liquid discharges, outlet condition liquid and vapor flows and physical properties will be provided for the project specified superimposed back pressure.

iv. ANALYZERS

Tag number, location, type of analyser, composition of fluid to be analysed, physical properties to be analysed, ranges of measurement, density and viscosity for liquids, molecular weight and compressibility factor for gases, operating & mechanical design conditions, alarm set point, control set point, etc. Composition of the fluid shall be indicated in terms of mol% for vapours and wt% for liquids. Type and details of on-line analyzers and their desired range of measurement during normal operation, catalyst regeneration, start-up etc. should be clearly mentioned.

v. TEMPERATURE AND PRESSURE INSTRUMENTS

Tag number, location, ranges, fluid properties data, operating & mechanical design conditions, alarm set point, control set point, etc.

vi. FLOW INSTRUMENTS

Tag number, location, flow rates (minimum, normal & maximum), allowable pressure drop, density & viscosity for liquids, molecular weight and compressibility factor for gases, whether liquid is congealing, operating & mechanical design conditions, alarm set point, control set point, recommendation for type, etc.

vii. LEVEL INSTRUMENTS

Tag number, location, upper and lower fluid density & viscosity, whether fluid is congealing, operating & mechanical design conditions, alarm set point, control set point, etc.

viii. WIRELESS INSTRUMENTATION

Tag number, location, service (Pump Seal, Exchanger, AFC, corrosion, steam trap leak), ranges, fluid properties data, operating & mechanical design conditions, alarm set point, conditioning monitoring software, etc.

ix. OTHER MISCELLANEOUS INSTRUMENTS

Tag number, location, process performance specifications and fluid properties as relevant including physical properties, operating & mechanical design conditions, alarm set point, control set point etc.

aa. GENERAL INSTRUMENT SPECIFICATIONS

- i. Centralized control center shall have DCS to support HART and Foundation Field Bus (FF Bus) technology. Only open loop Instruments required for indication purposes shall be compatible with FF Bus technology with digital signal processing.
- ii. Instrument Technical specification and Instrument data sheets shall be provided in BDEP according to HART/FF Bus technology. HART protocol instruments shall be used for ESD, Fast loops like compressor controls, Critical process loops in general for all closed loops, fixed type gas detectors and all type of analyzers.
- iii. Design of Instrumentation for modification / revamp / augmentation of existing units shall be in-line with existing instrumentation of respective units.
- iv. Advanced process controls as required for the process are to be incorporated.
- v. Functional Schematics for Complex schemes with complete description and write-up shall be provided.
- vi. To carry out adequacy check of the existing DCS/ ESD system for integration of OSBL instrumentation to other plant DCS/ESD, wherever required and recommend required augmentation.
- vii. Mandatory Spares details as per project spare philosophy shall be clearly specified in MR and PR documents and verification of the same shall form part of Inspection dispatch clearance from consultant.
- viii. Wherever applicable pre-fab instruments are to be implemented.
- ix. Control valve/ flowmeters design and sizing to be carried out using instrument OEM/vendor independent software
- x. Manifold Hookup drawing for different type of instruments
- xi. SIL calculations
- xii. Preparation of Cable schedule
- xiii. Preparation of Cable tray schedule
- xiv. Instrument air network design
- xv. Cable tray routing layout

bb. Smart Plant Concept

- i. Intelligent P&ID with seamless integration into 3D Modelling database
All P&IDs shall be developed as Intelligent P&IDs with required database. These Intelligent P&IDs shall be linked with Editable 3D Model. It shall have facility to navigate from Intelligent P&ID to 3D Model and vice-versa. Licensor shall provide SEED files of P&IDs developed in Intelligent P&ID showing process equipment, piping with line sizes, essential instrumentation, piping classes, insulation and heat tracing.
- ii. Electronic Project Data and Document Management System for smooth hand over of data and flow of information amongst different package vendor.
- iii. Consultant to facilitate the following Facility for the Project site
 - IP Based Boundary Surveillance CCTV System (Wired / Wireless)
 - Access control system based on biometric / RFID

- Employee Attendance system
- Digital Signage board at prominent places
- Digital Communication for IP based Telephone system
- Augmented Reality /VirtualReality technology for training operator.
- Smart Glass for displaying real environment to remote site through Cloud computing for trouble shooting and approval.

cc. PROCESS

- i. Handheld devices for field data monitoring (PI, TI, Vibration and Amps) using RFID and wireless gateway.
- ii. Value addition dashboard in Main control room at MR. Large video screen with multiple high-definition displays to monitor multiple data feeds, security cameras, and critical information simultaneously, facilitating faster decision-making during emergencies and routine operations.
- iii. Manufacturing execution system and Advanced Process control.

dd. Information System

- i. Artificial Intelligent based predictive & preventive maintenance application for all critical instruments, Analyzer systems. Shall include Pump Healthiness monitoring and Exchanger fouling status also.
- ii. Considering interface with BPCL IT network, DCS/ESD OT system comprehensive vulnerability, risk & threat assessment and accordingly network/zone segregated architecture design & implementation as per IEC 62443 [IACS/ OT cybersecurity]. Necessary cybersecurity policy and procedure, risk & response matrix etc. to be developed as per standards.
- iii. LAN / WAN Network Connectivity between the project facilities at Mumbai Refinery

6.13 ELECTRICAL

CONSULTANT shall undertake the following electrical engineering work

- a. All the electrical equipment has to be energy efficient and standardization to be kept in mind while selecting.
- b. Construction power requirement.
- c. Prepare design basis considering relevant standards and BPCL requirements.
- d. Prepare detailed specifications for all electrical equipment required to be installed for completion of project
- e. Prepare specifications for Pressure Recovery Turbine (PRT) Generator along with its transformer and other auxiliaries.
- f. Designing of main PRFCC Substation for Mumbai – Refinery. BPCL-MR main PRFCC Substation shall cater total requirement proposed PRFCCU load and shall have space to accommodate part of PRFCCU (ISBL) switchgear / transformer etc.

- g. Liasoning with Power Distribution licensee (Tata Power) for 110kV power feeders and related equipment for BPCL from Tata Power. Making cost estimates and tendering in coordination with Tata Power.
- h. Designing of required no. of substations within the available space for PRFCCU and associated OSB. Hook up with existing electrical substations for offsites utilities with adequacy study of existing system.
- i. Designing electrical equipment (Rating of HT / LT switchboard, Transformer and motor).
- j. Preparation of Single line diagrams covering all electrical equipment's including power, lighting, control and instrument requirements.
- k. Substation equipment layout drawings.
- l. Preparation of SLD for Emergency Power network for project including hook up with existing electrical system.
- m. Designing of Emergency Power by providing new emergency DG set to new facilities.
- n. Design of Electrical Sub Station Building
- o. Electrical system study for equipment startup, Load flow, short circuit analysis, relay coordination, energization, voltage drop profile, transient stability, load shedding and islanding, etc. of new proposed distribution system with all downstream and existing power system details.
- p. Preparation of all cable route and layout drawings, clearly indicating overhead and underground cable routings.
- q. Lighting layout and welding receptacles layout for units as well as Substation building, SRR and control room.
- r. Preparation of Cable Schedule for all types of cables.
- s. Preparation of Cable tray schedule.
- t. Preparation of list of cables and electrical equipment for fireproofing as per OISD standards.
- u. Preparation of Motor Data Sheets and motor load list summary.
- v. Preparation of Data sheets of all electrical equipment's.
- w. Design of Communication system.
- x. Design of Fire Alarm and Smoke detection System for plant as well as all buildings and integration with the existing system in case of BPCL-MR
- y. Area classification for erection of various electrical equipment, fittings and accessories.
- z. Equipment layouts showing location of the electrical equipment
- aa. Earthing layout for all electrical equipment and static process equipment as per statutory guideline.
- bb. Design and arrangement of lightning protection, for electrical, process equipment, buildings etc. wherever required.
- cc. Specification for complete electrical installation work with schedule of quantities.
- dd. Designing of protection system for all electrical equipment like Transformer, motors etc. including distribution system equipment and any other system related to this work.

- ee. UPS supply network.
- ff. Design of Normal, emergency and critical lighting for plant, SRR and substation
- gg. Designing of Load shedding scheme and its cable network and its connectivity. Review and prepare Block diagrams for new Load shedding and islanding system considering various contingencies for MR
- hh. Complete electrical system study with relay coordination including coordination with existing/ new upstream system, stability of the system, load-flow study, system harmonic impact and any other scope agreed with the OWNER.
- ii. Design of cathodic protection system
- jj. Design of Heat tracing system and preparation of layouts
- kk. Detailed designing of the Electric traction Lift and preparation of Data Sheets
- ll. Designing of HVAC system for Substation, SRR and control room building
- mm. Block diagrams for LAN network system of Substation and SRR/Control room and its integration with existing system
- nn. Schedule for Bulk Electrical Material Take-Off (MTO).
- oo. Approvals from statutory bodies like CEA, lift inspectors, duty inspectors, etc.

6.14 CIVIL ENGINEERING

CONSULTANT shall carry out following civil WORK.

- a. Prepare design basis.
- b. Prepare P&ID for extension of fire water network (including underground piping if required) in the units
- c. Prepare U/G piping and other underground facilities drawing for collection of OWS / process waste /CBD / CRW / Condensate recovery including hook-up with existing system and material take-off.
- d. Design Fire Protection System and prepare MR of all items required thereof. Fire water system to have risers and monitors for technological structures, sprinkler system for hot equipment/fin-fan coolers as per OISD norms, if required.
- e. Prepare cooling water layout
- f. Prepare documents/drawing for PESO/CIF approval and assisting BPCL in technical discussions with regulatory authorities.
- g. Site development drawing including site grading, drainage, roads, culverts, tank pads, storm water disposal system, sewerage systems, drinking water system, industrial waste and chemical waste including solid waste storage pit.
- h. Preparation of overall plot plans showing arrangement of buildings, structures, future provisions, tankages, road, paving and other facilities.
- i. Layout and construction drawing of buried piping system including material take off with specification.
- j. Technical specification and SOR for civil and structural, painting, insulation & Fireproofing tender.

- k. Inter connection of Drainage, & underground piping at unit battery limit.

6.15 STRUCTURAL & ARCHITECTURAL ENGINEERING:

CONSULTANT shall carry out following structural and architectural engineering work:

- a. Prepare design basis.
- b. Study of master plan and finalization of building locations.
- c. Preparation of building plans for approval from statutory authorities wherever applicable.
- d. Preparation of tender specification for soil investigation required for work and interpretation of data furnished by contractor.

6.16 FIRE PROTECTION

- a. CONSULTANT shall specify the fire protection, firefighting, fire alarm, hydrocarbon detection requirements for all equipment and plant.
- b. Fire Hazard Analysis
- c. Fire Water Sizing Calculation
- d. Firewater Demand schedule
- e. Fire Water Layout
- f. Fire Protection Drawings
- g. Fireproofing Layouts
- h. Fire and Gas Detection Layout
- i. Evacuation and escape plans (if applicable)
- j. Fire Equipment data sheets
- k. Connection of new fire system with existing system if available.
- l. For HVLR, control panel should be at suitable height.

EXHIBIT-B**CONSULTANT'S SCOPE OF WORK FOR REVIEW / UPDATE AND FINALIZATION OF FEED PREPARED FOR LICENSED UNIT****1.0 SCOPE OF WORK**

CONSULTANT shall perform services for the PROJECT, Units & Facilities under the scope of which is as explained in this document.

Unless otherwise specifically agreed, as such CONSULTANT shall perform and be responsible for the performance of all services as necessary for or incidental to providing comprehensive project management and associated services for the Project.

Some of the salient features of the scope of work for each facet of the Project activities are described hereinafter. These details are not limiting, and the CONSULTANT will be responsible for all other activities required to achieve completion of the Project, notwithstanding that the same are not specifically set out below.

Licensor / PMC has carried out the activities pertaining to Preparation of FEED for PRFCCU and ARU considering the EPC mode of execution for EPC contract of entire units. Now, the project shall be executed on EPCM / Package mode. Accordingly, the Review, Updation, preparation and finalizing the complete document including removal of 'Hold' as applicable in coordination with the Licensor / OWNER / PMC shall be in the scope of consultant. The obtained BDEP / FEED / Process Packages shall be segregated and converted into the document required for EPCM / Package mode of execution.

PTU (Purge Treatment unit) and WGS (Wet Gas Scrubber) are vendor specific packages wherein only the input and output parameters were specified by the Licensor These will be executed on Package methodology as indicated in Chapter 1.

All scopes pertaining to Engineering, Procurement and construction management allocated for EPC in existing FEED, prepared by PMC, shall be considered included in the scope of consultant, other than those which are not included in generic EPCM methodology. Such points can be omitted from consultant scope after discussion between OWNER and Consultant.

It is CONSULTANT to note that the BDEP / FEED format / scope will be licensors / PMC specific and it is expected that the scope under Residual Design and Engineering will be based on the available details in the BDEP / FEED of the various licensing units for completion of entire project.

Consultant Scope shall also include checking the FEED / BDEP / process packages in all respects and any incompleteness / missing information or in circumstances where the Consultant challenging the work carried out by PMC / OWNER shall be listed out and same shall be carried out by Consultant's without any extra cost for residual design and detailed engineering thereafter to ensure completeness before going to the market for selection of vendor and contractor.

1.1 PROJECT MANAGEMENT

CONSULTANT, during various phases of the Project, shall be responsible for total management of Project activities covering (but not limited to):

- a. Review and Updation of FEED / BDEP / Process Design
- b. Coordination with Process Licensors including extended/residual basic engineering on licensors' packages.

1.2 PLANNING & CONTROL

- a. Developing project scope and procedures for the entire project.
- b. Preparation of Network for the project and updating of the same by periodic evaluation and review, identifying the critical activities and its close monitoring to adhere to the overall project schedule.
- c. Preparation of networks for PACKAGE jobs as sub-projects.
- d. Preparation of detailed networks, bar chart schedule covering all concerned activities to be performed by CONSULTANT in keeping with the overall project schedule.
- e. Preparation of Master Project Schedule for mechanical completion, commissioning of the project including pre-project works.
- f. Preparation of Master planning document for the entire project and its regular updation.
- g. Preparation of major milestones for the entire project including that of PACKAGE works.
- h. Developing an appropriate MIS covering monitoring, reporting, controlling, feedback, mid-term corrections. Assist OWNER in preparation of reports for ministries.
- i. Organize & participate in regular project review meetings monthly and daily/weekly at site or as required and submit monthly progress reports and daily / weekly / fortnightly flash reports on Engineering/Site Services.
- j. Ensuring submission of as built drawings and P&IDs by PACKAGE Contractors.
- k. The CONSULTANT and the contractors (PACKAGE) shall use common computer software for ease of information exchange/ data integration.
- l. Furnish all data and drawings in electronic/ Hard disk format (text in MS-WORD, data in MS-EXCEL and drawings in AUTOCAD later versions) along with hard copies.
- m. Suggest catch up plan to bring back the project on schedule, if delayed.
- n. Furnish weekly report of progress on catch up plan
- o. The list of deliverables for planning & monitoring of the project is included in Chapter-2 Consultant Scope of work.

2.0 SERVICES DURING PROCESS DESIGN / FEED REVIEW PHASE

2.1 RESIDUAL PROCESS DESIGN

CONSULTANT will ensure the design packages are complete and comprehensive to enable take-off for subsequent detailed engineering. CONSULTANT will carry out extended / residual basic engineering on licensors' packages as required such as mark-up of P&IDs, conversion to uniform piping specifications, etc., so that final packages to be specified by CONSULTANT in Tender Documents for PACKAGE jobs are complete, uniform and suitable for PACKAGE tendering. CONSULTANT shall perform the following jobs regarding Residual Process Design.

Review the completeness and consistency of data/ information and identify any mismatch for licensed process engineering packages, adherence to OISD and other relevant safety norms as per the following and furnish the modification/ addition/ deletion to be carried out on process package.

- a. Process Flow Diagrams showing numbered process flows, process temperatures and pressures in equipment and piping at all stages of process, critical control elements and qualities/composition of streams. Heat and Material Balances of all the numbered process flows on Process Flow Diagrams and showing the normal composition and conditions of each stream including the catalyst/chemical/ utility/ effluent summary.

- b. Equipment list (Item number & description)
- c. Piping and Instrumentation Diagrams:
 - i. Complete piping and instrumentation hook-ups for process and utility piping for start-up, operation, bypass, shutdown and emergencies etc.,
 - ii. Line specifications including sizes, materials of construction and code numbers, rating etc. Sorting out any discrepancies in different standard followed by licensor.
 - iii. Instrumentation control loops including operation & emergency shutdown requirements and trips system.
 - iv. Control valve and relief valve sizes, types and response on air-failure.
 - v. Elevation of equipment wherever they are critical for the process.
- d. Effluent generation from the unit and process.
- e. Flare load summary
- f. Layout

2.1.2. Identify the scope that are not covered in the process package and design of all such systems like utilities, close blow down, OWS, Safety Relief, Fire networks etc.

2.1.3. Develop P&IDs for all utility systems of licensed units including that for close blow down, OWS, Safety Relief (Flare), Fire networks etc. Participate in the review meetings with Process Licensors (need based) along with the OWNER and also coordinate among the Process Licensors and PACKAGE Contractors for smooth two-way transfer of information. CONSULTANT shall obtain all queries/clarifications on process package within one month of handing over of process package.

2.1.4. Carry out the adequacy checks with regard to offsite/utility hook-ups connections and firm up the exact location of tie-ins/hook-up connections.

2.1.5. CONSULTANT along with licensors shall carry out initial HAZOP study of process plants and other facilities as required. CONSULTANT will coordinate and ensure that the recommendations of HAZOP studies are incorporated in the respective P&IDs (also recommendations which is not carried out by licensors).

2.1.6. CONSULTANT shall perform final HAZOP SIL study of the process plants and other facilities as required in Consultation with Licensor at the detailed Engineering phase of the Project. CONSULTANT will coordinate and ensure that all recommendations of HAZOP studies are implemented during construction. Further CONSULTANT shall incorporate all the necessary recommendations in the P&IDs. CONSULTANT shall also ensure that all the requirements of OISD and other statutory bodies are implemented.

2.2 ENGINEERING DESIGN BASIS

CONSULTANT shall develop an Engineering Design Basis Document in consultation with OWNER for the project to ensure uniformity of the systems and design for all process units and enable optimal integration of common utilities, offsites and general facilities of the project meeting the requirement of licensors. The Engineering Design Basis shall comprise information as follows:

- a. Definition of the Project complex/individual unit(s).
- b. Location/ site data/ Meteorological data.
- c. Seismic considerations and design criteria
- d. Utility specifications

- e. Equipment design considerations (e.g. economic criteria, standardization, constructability issues, sparing philosophy, limitation of size, weight, capacity etc.)
- f. Design guidelines
 - i. Systems (units) of Measurement
 - ii. Codes, standards and Practices
 - iii. Noise level
 - iv. Maintenance facilities
 - v. Plant & equipment layout guidelines
 - vi. Numbering (coding) systems for equipment, pipelines, valves, instruments etc.
 - vii. Legends/symbols for equipment, piping, electrical, instrumentation, etc. (as per the process package)
 - viii. Insulation/fireproofing requirements
 - ix. Heat tracing requirements
 - x. Electrical and instrumentation requirements
 - xi. DCS/ESD design requirements
 - xii. IACS/OT Cybersecurity design requirements as per IEC62443 & relevant standards for OT systems.
 - xiii. Piping specifications including Piping Material Specification (PMS) and Valve Material Specification (VMS).
 - xiv. Specifications for Civil/Structural work, Buildings (including architectural features).
 - xv. Environmental and Safety requirements.
 - xvi. Drawing and documentation
 - xvii. Procedures Telecommunication facilities.
 - xviii. Firefighting network and system.
 - xix. Roads and other Infrastructure.
 - xx. Utilities like Plant and Instrument Air, Service Water etc.
 - xxi. Flare system.
 - xxii. Internal Fuel Oil/Gas network
 - xxiii. OWS/ Storm water system.
 - xxiv. Criteria for interchange ability of rotary equipment
 - xxv. selection of commissioning, mandatory, Operation and maintenance spares of various equipment as per BPCL guidelines and also include necessary spares other than mention in BPCL guidelines.
 - xxvi. Criteria for carrying out stress analysis of various piping systems.

This document along with Process Unit Design Basis will be issued by CONSULTANT for preparation of Basic Engineering Design Packages by CONSULTANT and licensors, as applicable.

2.3 FRONT END ENGINEERING DESIGN (FEED)

CONSULTANT shall Review, update and finalize the Front-End Engineering Design (FEED) / BDEP / packages for various units/ equipment as follows:

CONSULTANT shall update FRONT END ENGINEERING DESIGN (FEED) Packages / BDEP / packages for the process units for execution through EPCM / Package mode as indicated in the tender document. The FEED / BDEP package developed shall be comprehensive to facilitate Vendors / Contractors / Package contractor(s) to take up detailed engineering and procurement activities immediately on award and shall contain the following details as a minimum:

2.3.1. PROCESS SAFETY

- a. Process Flow Diagrams Fire Water Systems and layouts.
- b. Process Safety Design Basis, includes equipment spacing requirements, Fire and gas detection, protection philosophy and any special requirements such as human factors
- c. Safety Specification
- d. Hazards Identification Analysis (HAZID)
- e. Process Hazards Analysis (HAZOP) and Safety Integrity Level (SIL) reviews
- f. Vapor Dispersion Modeling Report (if applicable)
- g. Thermal Radiation Modeling Report (if applicable)
- h. Blast Overpressure Modeling Report
- i. HSSE plan
- j. HSE design philosophy
- k. Hazardous area drawing

2.3.2. MECHANICAL

a. Requirements of Design & Data sheet

- i. CONSULTANT shall update / prepare / obtain Equipment data sheets to initiate mechanical design and specifications. These data sheets shall be prepared for each piece of equipment and shall cover all process requirements as furnished by Licensor(s) / PMC / OWNER and other information/ data developed by the CONSULTANT. These equipment include Reactor, Regenerator, Separator, Catalyst Hoppers, Vessels, Towers, Reactors, Adsorbers, Drums, Column including trays, Heat Exchangers, Air coolers, Slide valves, Rotating equipment, Strippers, Filters, separators, Package equipment's, Licensor supplied internals and all other miscellaneous/ special equipment such as Feed filter, basket filter, EOT, HOT as given in the process package(s).
- ii. 'U' tube bundles shall not to be used for cooling water service to enable cleaning of bundles.
- iii. The data sheets shall cover Tabular Specification along with required drawings/ sketches as follows:
 - Type and capacity

- Skeleton Drawings showing basic construction and main dimension including details of all internals.
- Operating pressure, temperature and other process conditions. (Max./ Normal/ Min.)
- Design pressure and design temperature.
- Materials (s) of construction (to be selected based on the Licensor's recommendations & inputs received from OWNER)
- Corrosion Allowance (s).
- Insulation and/ or refractory lining(s) requirement and specifications thereof.
- Minimum thickness requirement.
- Applicable Covering design codes, standards and specifications including local codes and regulations.
- Instrument Data Sheets for all numbered instruments appearing on the P&I Diagrams and covering all process requirements.
- Complete details of nozzles, viz. size, schedule, orientation, reinforcement requirements etc.
- Insulation, painting and fireproofing systems requirements.
- Inputs for mechanical design to suit the process operating conditions.
- Inputs for preparation of mechanical drawings with sufficient details for the fabricators to prepare fabrication drawings.
- Inputs for preparation of specification and material requisitions for purchase of equipment and materials.
- Equipment data shall be submitted in soft copy in Excel as per the SAP / Meridium Format. The format (data required) for each type of equipment (Rotary, Static, Electrical and Instrument) will be given to the consultant by the OWNER.
- Material Requisitions for Quotation for Long lead items, if required
- Equipment List

b. Additional Requirements of Design and Data

In addition to the requirements stated above, the data sheets of following equipment updated / developed / obtained by the CONSULTANT shall include additional information as given below:

i. HEAT EXCHANGERS

Thermal Design viz. Tube pitch, length, number, layout, baffle cuts, No. of passes etc.

Requirement of sacrificial anodes shall be clearly indicated based on site utility /OWNER requirements.

ii. FURNACE

This includes all types of Heaters/ Furnaces, ID/FD fans, Air pre- heaters etc.

- Thermal Design and API Data Sheet
- Inputs for preparation of specification and material requisitions for Soot Blowers, Coils, External Surface Tubes, Heat Resistant Tube Support, Casting, Burners, Dampers etc.

iii. COLUMNS

- Inputs for detailing of internals including Trays, Valves, Nozzles, Manholes etc.
- Any special requirements such as Leakage test, cladding requirement, fireproofing etc. as per codes & requirements

iv. TRAYS

- Finalization of Hydraulic & mechanical data of trays to suit process/operating conditions except those supplied as a part of process package by process licensors ensuring performance guarantees.
- Guidelines for preparation of complete support ring and bolting bar, distributors, sprayers, draw off etc. detailed layout drawings.

v. VESSELS

- Any special requirements like cladding, refractory/ special lining etc.

vi. REACTORS

- Details of Internals like distributors, supports, Cyclones, etc.
- Any special requirements like cladding, welding etc.
- Advanced inspection technique like TOFD shall be done during fabrication/commissioning and the report in soft copy shall be given to the OWNER for future reference.

vii. ROTATING EQUIPMENT

- This includes all items such as pumps, compressors, turbines, agitators, mixers, fans, blowers, air-conditioning and ventilation ejectors, chillers, separators etc.
- Applicable General specifications
- Minimum efficiency, minimum flow, drive requirements, sealing and flushing plans, requirements of accessories and auxiliaries etc.

2.3.3. PIPING

CONSULTANT shall carry out the following jobs for piping which includes all types of piping viz. process piping, vapor lines, utility piping, flare piping, instrument air piping, steam piping etc.,

- a. Development / Updation of preliminary equipment layout including corridor pipe-rack preparation
- b. Preparation of piping design criteria and including statutory requirement for stress calculation, flexibility analysis & configuration
- c. Furnishing material specifications for pipes, pipe fittings valves, flanges, gaskets, fasteners, steam traps, drains, vents etc.
- d. Inputs on welding, testing, NDT specifications & requirements.

- e. Identification, finalization and indicating the relevant drawings of all hook-up points in consultation with OWNER.
- f. Pipe Support (Standard) also includes OWNER's requirement.
- g. Insulation and Piping Specification
- h. 3D Model, if required for estimation
- i. Nozzle Orientation – long lead equipment.
- j. Tracing Specification
- k. Narrative piping material specification/ Valve material specification
- l. Piping Material Control Plan
- m. Tie-in list
- n. Bulk Material Specification.
- o. Utility Station, Eyewash and safety shower location plan
- p. Lifting chain pulley block/ EOT/ HOT
- q. Digital Radiography and other digital requirement
- r. Pre insulated tubing

2.3.4. ELECTRICAL

CONSULTANT shall perform the following jobs in connection with the general electrical requirements for the project:

- a. ELECTRICAL REQUIREMENT FOR THE PLANT
 - i. CONSULTANT shall undertake the following jobs:
 - ii. CONSULTANT shall collect and compile the load data, the emergency power requirements from each of the PROCESS LICENSOR's packages as well as open-art units and assess the electric power requirements of the complex. The same shall form part of Utility Process Package (BDEP)
 - iii. Estimate the projected load requirements, maximum demand, emergency power, the selection of voltages and distribution network configuration, substation locations etc.
 - iv. All the electrical equipment/ system selected shall be state of art and energy efficient.
 - v. Undertake Basic Engineering and other related services for hook up from proposed new PRFCC sub-station to other sub-station.
 - vi. Material requisitions for long lead items i.e., 33 KV GIS, 22KV/22KV hook up transformers, 11KV/22KV Step up transformer for PRT etc. required for building new PRFCC sub-station.
 - vii. Review the process operating requirements and classify the electrical loads into critical and non-critical according to the effect on combined plant operation and equipment safety and arrange power distribution accordingly.
 - viii. Specify realistic ambient conditions for electrical equipment, considering the Site conditions as well as process originated environments.
 - ix. Specify the installation methods of electrical equipment such as - cable trench arrangement, method of laying, spacing, marking and termination.

- x. Highlight in the specifications all the specific requirements of Indian Electricity (IE) CEA rules, and appropriate Electrical Inspectorate's requirements.
- xi. Prepare computer Based Power System Analysis, Calculations for transient stability, higher rating motor starting, short circuit and load flow study.
- xii. Prepare Electrical Equipment List
- xiii. Prepare Low Voltage, Medium voltage, High Voltage, Extra high voltage equipment specific single line diagrams with protection and control.
- xiv. Design Substation Automation System Architecture Block Diagram
- xv. Substation equipment layout
- xvi. Electrical Heat Tracing requirement and layout
- xvii. Electrical Equipment Datasheets
- xviii. Overall cable tray and trenches layout sketches and laying philosophy.
- xix. Cathodic Protection Details. FA and SD system in substation/ plant.
- xx. Earthing and Lightning Protection detail and layout.
- xxi. Roof top solar panel on substation building.
- xxii. SRR/ Control room building/ Admin building shall have Solar Renewable power plant if permitted as per area classification.
- xxiii. Islanding and Load Shedding system
- xxiv. Dual redundant VFD system for Critical Pumps, Blowers, Compressors, ID/FD fans.
- xxv. Lightning Protection of All Buildings, Sheds and Structures
- xxvi. Lifts for Plant and Substation
- xxvii. HVAC System for Control Room/ SRR/Substations
- xxviii. APFC system/ Capacitor banks for power factor correction.
- xxix. STATCOM SYSTEM for Harmonic mitigation
- xxx. Synchronous motors for large rating requirements.
- xxxi. Energy Management system & Other Electrical automations
- xxxii. Location of Non FLP construction power boards to be used in future while plant is under shutdown

a. CONSTRUCTION POWER, LIGHTING AND COMMUNICATION SYSTEM

CONSULTANT shall develop the following designs:

- i. Basic lighting layout, lighting distribution arrangement for the plant, offsites, roads, security, plant roads and material storage yards including illumination levels (LUX levels) etc.
- ii. Suitable communication system to meet the needs of construction as well as operational phases viz. Communication system, type & number of telephone connections, extensions, size of exchange etc.
- iii. Block flow diagram for Plant Communication system.

- iv. Construction power distribution scheme to maintain uninterrupted works at site. Package substation with 6.6KV HT input power shall be considered for at PRFCC site and 415V LT Distribution board for other OSBL project sites.

b. PROJECTPOWER DISTRIBUTION SCHEMES

CONSULTANT shall develop the following:

- i. Design the distribution network(s) with adequate redundancy in cable routes and sizes, substation locations, layout configuration, protection scheme, metering, indications, alarm annunciation and earth bus layouts.
- ii. Design electrical network to provide for remote substation operation. For this, centralized supervisory system shall be provided to permit remote monitoring of breaker operation & remote metering.
- iii. Specific studies covering system stability, dynamic behavior of the generators, dynamic stability studies for load shedding and load sharing control, relay co-ordination and load flow, short circuit and harmonic study to ensure system reliability.
- iv. Selection of suitable system for startup of the motors.
- v. Scheme for tapping power from the existing power system wherever required along with its impact on existing system and remedial measures.

c. PLANTELECTRICAL EQUIPMENT

CONSULTANT shall review and update area classification drawings provided by process licensors and specify suitable requirement for electrical equipment like motors, field control stations, light fittings, Junction Boxes, Distribution Boards, communication call points, etc. PESO approval of the final Area classification drawing shall be carried out by consultant

d. STANDARDIZATION

CONSULTANT shall ensure standardization in light fittings, motor frame sizes, HT/LT Switchgears, Power and distribution transformers, EHV/HV/LT cables, DC systems, UPS systems and Plant Communication systems to minimize spares. All the equipment's shall be energy efficient.

e. FIRE PROTECTION

CONSULTANT shall specify the fire protection, firefighting, fire alarm, hydrocarbon detection requirements for all equipment and plant.

- i. Fire Hazard Analysis
- ii. Fire Water Sizing Calculation
- iii. Firewater Demand schedule
- iv. Fire Water Layout
- v. Fire Protection Drawings
- vi. Fireproofing Layouts
- vii. Fire and Gas Detection Layout
- viii. Evacuation and escape plans (if applicable)
- ix. Fire Equipment data sheets

x. Connection of new fire system with existing system if available.

xi. For HVLR, control panel should be at suitable height.

f. **EMERGENCY POWER AND HVAC**

i. CONSULTANT shall prepare the emergency power requirements including lighting and specify emergency diesel generator capacity with automatic quick start and changeover features and stipulate criteria for selection of DC systems & UPS types, its capacity, locations etc.

ii. CONSULTANT shall provide input for HVAC, lighting, earthing, lightning, fire and smoke detection system for control room, SRR and substation to PACKAGE contractor for designing.

2.3.5. INSTRUMENTATION

CONSULTANT shall perform the following jobs for instrumentation part of the Project:

- a. Prepare the basic process control philosophy of the total project. The philosophy should be defined to accommodate future developments in the field of instrumentation.
- b. Instrument Reliability & Power Supply Backup Philosophy
- c. Main Automation contractor (MAC) / Main Instrumentation Vendor (MIV) Philosophy
- d. Main Automation contractor (MAC) / Main Instrumentation Vendor (MIV) Scope Definition
- e. Analyzer Systems
- f. Instrument Index
- g. Control System, Safety and Instrument Philosophy and Design Criteria for Mechanical Packages
- h. Functional Design Philosophy for Instrumentation
- i. Typical Control & Safeguarding Function Definition
- j. Complex Loop Diagrams, Cause and Effect Diagram Development
- k. The Control philosophy should include as a minimum type of Distributed digital Control System (DCS), Redundancy concept in control/data acquisition system, DCS system architecture, DCS/PLC specification, Type of operator interface, Type of Advanced control/optimization interface with DCS system, Type / Concept of different layers, of controls, Interlocks, detectors, analyzers, LAN, WAN, Type of different field instruments viz. FF & Smart Transmitters, FF & Smart positioners, control valves, Pressure / temp gauges, shutdown valves, actuators, Wireless Instrumentation, etc.
- l. Based on the Process optimization philosophy, CONSULTANT shall develop scheme for its integration to DCS system. CONSULTANT to define the type of computer environment required for Process optimization / MIS purpose.
- m. Prepare installation standard and Loop checking philosophy of different types of instrumentation based on application.
- n. Prepare guidelines for Engg. Standards / essential technical specifications for procurement of different types of instrumentation and control equipment.

- o. Review/sizing of safety valves, all control loop elements e.g. Control valves, DP transmitters, controllers, interlocks, etc.
- p. Develop basic specifications for DCS, PLC and associated Control Room instrumentation.
- q. Finalize inputs for developing software for DCS / PLC in consultation with OWNER.
- r. Develop Control Room arrangements.
- s. Develop / generate MIS reports, log sheets report through DCS.
- t. Review of all construction drawings of instruments e.g. Control & Signal cable layout, JB layout, Trench & duct layout, Control room instrumentation, Power cable layout, etc.
- u. CONSULTANT to define C.C.T.V. system to monitor flare and other critical system.
- v. Control Narratives
- w. SIL identification & designing safety instrumented system for achieving SIL targets
- x. DCS I/O Count
- y. Alarm Management Philosophy
- z. E&I Building Layouts
- aa. Telecommunications Philosophy
- bb. Telecommunication Design
- cc. Main cable way routing
- dd. Fire suppression system for Control room and SRR
- ee. Cybersecurity requirements for OT system
- ff. Wireless instrumentation design philosophy
- gg. Foundation Field-bus Instrument design philosophy
- hh. Third party system communication to DCS philosophy
- ii. MCC signal interface design requirements
- jj. Main cable duct sizing philosophy
- kk. Documentation software & Instrumentation diagnostic / asset management software / sizing software identification

2.3.6. CIVIL

1. GENERAL CIVIL

- a. CONSULTANT shall prepare inputs for technical requirements/standards for all types of civil engineering and structural work indicating but not limited to the following:
 - i. Fire Water system
 - ii. Cooling water system
 - iii. Raw Water system
 - iv. Drinking water system
 - v. Effluent collection and disposal including all drainage, storm water/ contaminated water, fecal etc.

- vi. Foundations of equipment/buildings etc.
 - vii. Structures/Platforms/Ladders etc. of concrete/steel.
 - viii. Raw material inputs/ requirements/ specifications like aggregate, cement, steel and other materials for buildings, roads, drainage as well as other construction material
 - ix. Bitumen / Concrete Roads
 - x. RCC culverts
 - xi. Compound walls / Fencing
 - xii. Green buildings
 - xiii. Security watch towers
 - xiv. Process wastewater treatment/ disposal
 - xv. Main PRFCC receiving sub-station main receiving sub-station and other sub-station required for plant.
 - xvi. Control room & Satellite Rack Room.
- b. The sampling/testing procedures will also to be established (While formulating the standards, suitability of local materials available in the region should be considered).
 - c. Specify design features for plant/non-plant buildings, taking care of stipulations of various statutory bodies in respect of compliance with respect to safety, health, etc. The design concepts should provide both for architectural beauty features and functional requirements to be merged effectively during basic/ detailed design of various facilities, keeping in view quality and economy.
 - d. Prepare preliminary plot plan showing arrangement of buildings, structures, tankages, road etc. confirming to all statutory and OISD requirement.
 - e. Include detailed/specific soil investigation requirements in the PACKAGE bid. However, the OWNER shall make the Preliminary soil investigation reports if available.
 - f. Study and include in the respective PACKAGE Contracts the unit wise and overall OWS/ Fire Water Network, Sewage/ storm water/ Process wastewater/ cooling water disposal systems required for the project.
 - g. Construction / Installation / Erection Specifications & Standards: Civil & Structural
 - h. Study Report: Site Infrastructure / Material Availability / Preassembly / Logistics
 - i. UG Space Management & Inputs to Plot Plan Development
 - j. Preliminary Design Sketches & MTO: UG Piping / Site Infrastructure
 - k. Preliminary Design Sketches & MTO: Piling, Foundations and U/G concrete
 - l. Preliminary Design Sketches & MTO: Above Ground Structures (Concrete/ Structural Steel)
 - m. Architectural - Building Types & Building List
 - n. Conceptual Design & MTO: Architectural & Building Systems
 - o. Room Finishing List
 - p. Construction / Installation / Erection Specifications & Standards: HVAC
 - q. Guide drawings for building

2. CIVIL STRUCTURALS

- a. Prepare inputs for foundations, structures, platforms & ladders.
- b. Prepare inputs for installation of equipment, technological platform, foundations attached to various equipment and other structures.
- c. Review and approval of Contractors/Vendors drawings and document as per contracts specifications and QAP for all the items as above.
- d. Scrutinizing and approval of the detailed engineering design/drawings for all the above item viz. Civil, Structural, Architectural.
- e. Suggest necessary change / modifications wherever necessary in conformity with tender specs,
- f. Adequacy checking of the existing structural where required for routing the Piping etc. along with remedial actions if any.
- g. Site Work Drawings, Rough Grade Drawings, Finished Grading Drawings
- h. Drainage Layout Drawings
- i. Foundation Drawings
- j. Detail 3D Model for Civil & Structural
- k. Module Weight Management / MTO Control Plan

2.4 DRAWING CATEGORIZATION

CONSULTANT should develop the list of construction & fabrication drawings categorizing them as "Drawings requiring Approvals" and "Drawings for reference".

2.5 ELECTRONIC COMMUNICATION SYSTEM

In order to facilitate transfer of various documents/drawings electronically/ through E-mail/ internet among OWNER, CONSULTANT, VENDOR, CONTRACTOR and PACKAGE contractors, CONSULTANT shall develop a suitable communication system for implementation by CONSULTANT, VENDOR, CONTRACTOR, PACKAGE Contractor and OWNER. All hardware and software required for CONSULTANT'S Site office/ Head office/ Design office shall be arranged by CONSULTANT.

ANNEXURE-II(A)**Consultant Scope of work for activities in EPCM / Conventional mode**

CONSULTANT shall perform services for the PROJECT, the scope of which is as explained in this document but not limited to for Project Management, Procurement, Expediting, Tendering, Construction Management and Supervision, Safety management, Inspection (At site works) and development of plant specific operating manuals and maintenance manuals, quality assurance, assistance for Pre commissioning, commissioning, start up, PGTR of plant and associated facilities.

General Notes: -

1. Procurement Services and contract services. Tendering & Award of and Closure of Contracts as required
2. Material Control, receipt and issue of materials including warehouse management.
3. Construction Management, Construction supervision & Quality assurance.
4. Inspection and Expediting services.
5. Project Management.
6. Preparation of plant specific operating manuals, Start-up, Pre-Commissioning and Commissioning Assistance
7. Assistance during Performance test run
8. Plan, initiate, guide, coordinate, supervise and control the entire activities through a team of specialists and experts on various aspects of the project.
9. Daily/Weekly meetings with the contractors, Progress review meetings with BPCL, replying to contractor's letters, closure of contracts, keeping proper measurement records, cement/steel/other material records, issue& consumption records, hindrance records and assisting OWNER for arbitration, audit, vigilance query, etc.
10. All the conditions, requirements, etc. stipulated by statutory authorities as part of the approvals/clearances / license issued by them should be implemented within the scope of the project / EPCM consultant.
11. Identification of requirement of paved area and carry out hard surfacing as required (Warehouse, Fabrication yard, Chemical warehouse, maintenance shop, Warehousing facilities, Hazardous chemical storage facilities etc.)
12. Identification and estimation of the requirements of any other Infrastructure facilities which are to be developed for the successful implementation of project.
13. Detailed Engineering/ Review of detailed Engineering for licensed units.
14. Storage and distribution of Drinking water and Permanent Drinking water connections to Plant area.
15. Development of Fabrication yards including area clearing, power/lighting requirement. Protection from rains/weather shelter may also be considered.
16. Culverts, Electrical Road crossings, Instrument cable ducts, Roads and bridges, drains for the existing culverts, modification of the existing culverts etc. in the entire offsite area.
17. Toilet facilities etc. for Contract laborers
18. Cameras for monitoring site safety conditions

19. Gas detector across boundary of plant to monitor & alert gas leaks from adjacent facilities
20. Fire call points, communication systems, fire safety systems etc. in the construction area
21. Warehouse and Associated facilities
22. Ensuring uninterrupted progress, continuity and smooth & seamless integration of jobs to achieve targeted overall project schedule, cost and quality of implementation.
23. Procurement Services and contract services. Tendering & Award of Package Contracts as required
24. Material control, receipt and issue of materials including warehouse management.
25. Construction Management, Construction supervision & Quality assurance.
26. Inspection and Expediting services.
27. Preparation of plant specific operating manuals, Start-up, Pre-Commissioning and Commissioning Assistance
28. Assistance during Performance test run
29. Daily/Weekly meetings with the contractors, Progress review meetings with BPCL, replying to contractor's letters, closure of contracts, keeping proper measurement records, cement/steel/other material records, issue& consumption records, hindrance records and assisting OWNER for arbitration, audit, vigilance query, etc.
30. Execution of tie in points for piping to/from PRFCCU/refinery for routing of feedstock, utilities, effluent streams, blow down streams, condensates etc., engineering and tender preparation for pipe racks.
- 31. Fire Water:**
 - a. CONSULTANT shall ensure that a comprehensive fire network adequacy study of the complex, after completion of all detailed engineering including detailed engineering by package Contractors. Recommendations, if any, shall also be executed & to be included in as built drawings.
 - b. The fire water network study and the assumptions are to be submitted to client to ensure adequacy of the fire water network after completion of the project.
- 32. 3D Model:**

Consultant shall prepare the model of all the facilities (including all OWNERs facilities) in an integrated & intelligent 3D software solution using rule-based, data centric 3D Design software with equipment drawings, data sheets, intelligent P&ID correlated with intelligent 3D Model, BOQ, schematics and logic diagrams etc. attached to the respective equipment / systems in the aforesaid 3D model. Consultant shall make a presentation on 3D model every 3 months from LOA to enable BPCL to review the progress of engineering. After the completion of engineering of respective areas, the corresponding complete 3D review model shall be handed over to the employer for its reference. Consultant shall provide 3D design review model (network ready, which shall include visual interference check, walk-through animation, video simulation for major equipment placement and removal, visual effect, photo realism etc.), which is extracted from intelligent 3D model, for employer's review as & when desired by employer. Carry out 3-D modelling in PDMS and hold stage wise model review at 30% & 60%, at Consultants Office and 90% at BPCL. 60% and 90% 3D model shall include lighting layout along with illumination levels. Furnish updated /as built 3D

model at the end of project. However, all piping layouts, equipment layouts, floor plans, ducting layout (Air/flue gas, AC, Ventilation etc.), structural arrangement drawings and RCC layout drawings shall necessarily be extracted from the aforesaid 3D model and submitted for employers review along with the 3D review model to enable BPCL to review and approve these drawings. Instrumentation & electrical JB's, Control panels, Analyzer systems, Instrument air network, E&I cable trays, Hook-ups with field instrumentation also shall be modelled. The solution shall be able to provide reporting capabilities utilizing 3D models (eg Progress / Construction status reporting in a web-enabled environment with inputs from Project Management solution such as Primavera / MS Project. A follow-up meeting shall be conducted to confirm the closure of all action points from the 90% stage review. This meeting may be held online with participation from the concerned personnel. A detailed report documenting the status of each action point shall be submitted.

1.0 PROJECT MANAGEMENT

CONSULTANT shall perform the following project management services:

- 1.1** All project activities including leftover from FEED / BDEP / process packages phases (residual process design, Detailed Engineering, 3D modeling Hazop Study etc.), planning, Estimating, Tendering, Procurement and Expediting, Construction Management And Supervision, Pre-commissioning, commissioning and Start-Up assistance, plant specific operating manuals, Test Runs of the units considered.
- 1.2** Preparation of Network of each unit separately as well as overall in Primavera and/or MS Project Software for the work and implementation of the same by periodic evaluation and review for identifying the critical activities and their implementation. The list of deliverables for planning & monitoring of the project is included in Chapter-2 Consultant Scope of work.
- 1.3** Consultant shall study and familiarize themselves with the SAP system. All the codification of materials, material requisition/ purchase requisition of materials, issuing of materials, preparation of Schedule of Rates (SOR) for works contract, certification of payment to contractors shall be done in SAP system.
- 1.4** Expediting the materials ordered for the project including approval of QAP for all items ordered by them through OWNER and issuing weekly / monthly progress reports as per agreed format. Issuing remedial action if any, with proper supporting documents.
- 1.5** Consultant shall have sufficient exclusive, qualified and experienced persons to manage and execute quality control functions as per QA plans. Consultant shall ensure availability of NDT equipment in their possession, like film viewer, PMI equipment, thickness gauge etc., which are essentially required for field verification of components.
- 1.6** Organize and participate in regular Project Review Meetings at OWNER's/ CONSULTANT's Office on Fortnightly / Monthly basis & at Site on Daily / Weekly / Monthly basis and submit Monthly Progress Reports and Flash Reports on Daily / Weekly / Fortnightly basis, for Engineering, Procurement & Site Services.
- 1.7** Assisting OWNER by way of preparing technical documentation for obtaining statutory approvals as may be applicable for the work execution such as approvals from Chief Controller of Explosives, Director of Factories & Boilers, Electrical Inspector etc.

2.0 DETAIL ENGINEERING

- 2.1** Consultant shall use PDMS and other design and engineering software for preparing detailed engineering works. This includes all items such as tanks, towers, surge drums, separators, pressure

filters, accumulators, columns and strippers, silos, agitators, RTO's, Incinerator waste, PRESSURE VESSELS AND OTHER FABRICATED Equipment, Reactors (Autoclave) and pipe reactors etc. either shop fabricated or erected at site. CONSULTANT'S scope of work in this connection shall be as follows:

- a. Preparation of material requisition containing equipment details, mechanical design, drawing and specifications to enable the fabricator to prepare detailed fabrication drawings.
- b. Review and approval of vendor drawings / QAP as per purchase conditions.
- c. EPCM has to line up the Execution contractor, supervise the construction and Other Structural jobs.

2.2 CONSULTANT'S responsibility shall in general include the following:

- a. Develop Detailed Engineering drawings in PDMS and specifications for proper amalgamation of the package unit/ system with the PLANT and PROJECT requirements.
- b. Develop enquiry grade data, documents and drawings for floating of bids/tenders.
- c. Review of vendor/ manufacturers' design and drawings and undertake engineering that would be necessary to incorporate such package units/ systems into the overall plant configuration. Liaisoning Licensor / PMC / any other agency, Consultant shall directly interact for obtaining any clarification required keeping the OWNER in loop.
- d. Review & approve data, documents, drawings and QAP received from the vendors/ manufacturers for such package systems, OWNER will also review if required.
- e. Monitor the receipt of documentation, warranties and back-up guarantees, operation manuals and as-built drawings from the vendor/ manufacturers. Consultant will take the suitable guarantees of the performance parameters of such packages/ systems from respective vendors.
- f. Construction/ Installation supervision and Project Management Services as applicable for all items.
- g. Prepare the vendor document index (equipment category wise viz vessel, exchanger, reactor, motor, pump, compressor, relief valve, bellow, rupture disc, filter, demister pad, de-super heater, ejector, injection nozzle, turbine, transformer, control valve, nucleonic device, flowmeters, analyzers etc.) and shall submit to OWNER for review and approval. For package, where multiple equipment has to be supplied (including accessories), all the relevant VDI (based on the type of equipment supplied within package) shall be part of the tender and EPCM to ensure the same.
- h. Provide editable PDMS/PDS model (as-built) to OWNER for entire project including package, offsite & utility.
- i. During the commencement of engineering shall obtain the SAP/Meridium format from OWNER for all equipment (Static, Rotary, Electrical& Instrumentation) and shall compile the data in the format and hand over the same to OWNER.
- j. To ensure that for all equipment supplied & fabricated at site (including package), base line thickness reading of equipment shall be submitted along with final documentation in A4 sketches and also auto cad drawing to be provided.
- k. TOFD shall be done for weld joints in all reactors as base line inspection data. TOFD nascent files and its viewing software shall be submitted along with final documentation.

- l. Minimum thickness calculation data (design calculation) for all equipment and piping specification (A1A, A2A etc.)
- m. All IBR document prepared by consultant/Forms provided by Manufacturer (Original) to be handed over to OWNER.
- n. Corrosion Control Document and RBI data in Meridium format shall be prepared for all units by consultant. Format will be provided by OWNER. Since OWNER has no prior experience in NEW FACILITIES, Consultant shall prepare an inspection manual identifying the type of inspection to be done and the extent of inspection for critical equipment.
- o. Consultant shall provide Maintenance & inspection manual for all specialized equipment. List of specialized equipment to be finalized in consultation with process licensor/OWNER.
- p. EPCM shall provide the specification for inspection window and also shall decide on the location of inspection window based on corrosion & accessibility in consultation with OWNER. All inspection window location shall be marked in 3D model.
- q. Color coding of materials in warehouse shall be discussed and finalized in consultation with OWNER.
- r. EPCM during 3D model (including package) shall ensure that no structural fouling is there for maintenance of equipment.
- s. PMI shall be done for all equipment and piping (CS above 300#, AS, SS). EPCM shall appoint a TPI to inspect the alloy.
- t. Soft copy of all documents, Vendor documents and Contractor documents shall be given to BPCL through EDMS. EPCM has to make a system for this which is having sufficient speed and connectivity.
- u. All commissioning activities (Loop clearance, NDT, HT, Formats etc.) including for equipment supplied /fabricated by package vendors shall be through Commissioning Software (PCAMS). EPCM shall make necessary arrangement for the same. Also, at the end of commissioning, soft copy of the entire document in PCAMS shall be given to OWNER.

2.3 HEAT AND MASS TRANSFER EQUIPMENT

1. HEAT EXCHANGERS

- a. Preparation of mechanical drawings with sufficient details for the fabricators to prepare fabrication drawings.
- b. Preparation of specification and material requisitions for purchase of equipment and materials. Consultant to consider additional requirements of OWNER whenever required.
- c. Techno-commercial evaluation of bids and prepare technical recommendation.
- d. Review and approval of Vendor's drawings, Issue QAP.
- e. Prepare tender inputs for installation, erection, testing and commissioning.

2. FURNACE/HEATER

- a. Preparation of MRs for Furnace components as per the implementation philosophy.
- b. Evaluation of Vendor's offer and making Techno-commercial recommendation.

- c. Checking and approval of Vendor design and drawings, QAP.
- d. Free Issue Items - Preparation of MR, carry out technical evaluation of bids, prepare technical recommendation, prepare Purchase Requisition, review vendor drawings and documents.
- e. Inspect, review and certify installation of trays.

3. TRAYS

- a. Preparation of specification and material requisition for purchase.
- b. Technical/ commercial evaluation of bids & prepare recommendations for purchase.
- c. Review and approval of Vendor's drawings, QAP.

4. MECHANICAL AND ROTATING EQUIPMENT

- a. This includes all rotary and static equipment
- b. Review of Vendor list.
- c. Preparation of purchase requisition/ technical recommendations.
- d. Review and approval of VENDOR drawings and design data, QAP when required.
- e. Inspection at vendor site for performance.
- f. Preservation at project site.
- g. Installation and commissioning.
- h. Documentation.
- i. Spares inventory.

2.4 PIPING

The scope will cover the following:

- a. Isometrics of all piping from engineering/ construction viewpoints. No isometrics would be prepared for carbon steel line sizes 1-1/2" and below provided the same is covered in Mechanical contractor scope. However, consultant shall ensure routing of these pipes as per P& IDs requirement and do not hinder maintenance and operation of the units.
- b. Prepare Material Requisitions and evaluate offers i.e. technical bid analysis, technical recommendations, Purchase Requisition with agreed deviations, etc.
- c. Review and approve vendor documents.
- d. Carry out field engineering for obtaining site details and site verification for preparation of approved for construction (AFC) drawings, and for trouble shooting at site etc.
- e. Preparation of drawings/ documents for approval by Chief Inspector of Boilers.
- f. The computer software for modeling to be used for piping shall be PDMS or equivalent for the entire work of layout & Design of Piping System, Structural layouts etc. Module for plant shall be done by the CONSULTANT. After completion of design/ details of the PLANT, the same shall be presented to the OWNER for review. OWNER'S comments shall be incorporated. All the Data/Documents/ Electronic files etc., shall be handed over to the OWNER of the finalized Model along with the necessary software. The review of 3-D modeling of the unit covering multi disciplines such as Civil & Structural, Mechanical, Electrical & Instrumentation shall be done at the following Stages (3D models starting from 30% should be in line with the P&ID

- i. 30% model: will cover all piping (4" and above), control valves, block valves NRV etc. and should also include underground piping, major foundations etc.
- ii. 60% model: will cover all piping < 4" Dia including equipment (except package) and those missed out in 30% model review.
- iii. 90% model: Review will include complete field instrumentation system including final control element/ cable duct/tray / junction box /instrument locations - tapings -Hook ups / Analyzer Shelter Location, instrument air distribution network Etc. CONSULTANT shall ensure that 3D model shall be developed & demonstrated with dynamic walk-through facility to check any interference, requirement of operation/ maintenance of instrument / equipment. CONSULTANT also to ensure that facilities of viewing/modifying the 3D model to be available at site.
- iv. A follow-up meeting shall be conducted to confirm the closure of all action points from the 90% stage review. This meeting may be held online with participation from the concerned personnel. A detailed report documenting the status of each action point shall be submitted.
- g. 100% Model: Plant completely modeled with all disciplines.
- h. Safety valves shall be re-tested at site before putting into operation.
- i. Confirmatory check for Isometric Drawings versus Piping & Instrumentation Diagrams to be done.
- j. Issue monthly statement on Bulk items procured including issue of enquiry, Purchase order placed, receipt at site with P&ID & Approved for Construction drawings. This shall accompany the Monthly Expediting status report.
- k. Piping data editable soft copy shall be provided to OWNER in a format enabling direct upload to RBI system.

2.5 PRESSURE VESSELS: (Includes storage tanks, vessels, columns/towers, surge drums, separators, mixers, filters, strippers, reactors, accumulators etc.)

- a. Carry out procurement activities including preparation of Material Requisition, offer evaluation, technical bid analysis, and technical recommendation.
- b. Prepare purchase requisition and technical agreed variations.
- c. Review and approve vendor data/drawings.
- d. Prepare tender inputs for installation, erection, testing and commissioning.

2.6 PACKAGE EQUIPMENT:

- a. Prepare Material Requisition (MR) for procurement.
- b. Carry out technical evaluation of bids and prepare technical recommendation.
- c. Prepare purchase requisition
- d. Review and approve vendor drawings.
- e. Prepare tender specification for installation, erection, testing and commissioning

2.7 INSTRUMENTATION:

The scope will also cover the following:

- a. Preparation of detailed instrumentation index and purchase specifications for all of the instrumentation items and analyzer systems.
- b. Consultant is required to participate in FAT/SAT related activities for all critical instrumentation system.
- c. Checking and approval of vendor data and drawings.
- d. Integration of DCS/ PLC/ RTDBMS with existing system in LAN level. Only communication/ networking integration is required with existing system. No further modification/ upgradation in the existing system is envisaged.
- e. Commissioning assistance for the plant including the critical systems like DCS/ PLC, analyzers, & all special instrumentation etc.
- f. Preparation/approval of quality assurance procedure (QAP) of all instrumentation items & ensuring inspection/testing as per specification approved documents, approved QAP.
- g. Review/approval of civil architectural drawing of control room.
- h. Review/approval of instrument air layout plan
- i. Review/approval of gas detection layout of plant area.
- j. Review/approval of all package instruments drawings/documents & their interface to DCS/PLC.
- k. Review/Approval of all DCS/PLC documents including logic diagram preparation of main PACKAGE instruments, technical write up preparation of complex loops, preparation of alarm/set-point schedule, load calculation, PLC scan time calculation etc.
- l. All instruments with their tag numbers for all operating modes of the unit including start-up, shutdown and emergency situations. Signals traversing between P&IDs as well as at battery limits will bear flagged connecting arrow- boxes.
- m. All instruments are required from a process standpoint on utility lines to individual process consumers. Definition of a process service is defined for piping.
- n. Instrument number, instrument designation as per ISA, insulation/ tracing requirements for all instruments. Instrument numbering philosophy shall be as per OWNER's system. All instrument P&ID symbols shall follow ISA symbols.
- o. Control loops and instruments for proper and safe operation.
- p. Size and air failure position of control valves. Type of control valve manifold either in the P&ID itself or as a legend referring to a specific table of valve size vis-a-vis manifold valve sizes to be followed.
- q. Clear identification of all hardware and software instruments both in field and in control room, philosophy of automated trips and start-ups, alarms, etc.
- r. Set pressure and recommended size of pressure relief valves.
- s. OWNER's philosophy towards use of single tapping points for multiple instruments,
- t. The consultant to obtain the preliminary SIL assessment report and recommendations from the Licensor if available. In addition, the consultant is responsible for conducting a comprehensive risk assessment for all new units and packages, taking into account interfaces with existing facilities and associated risks, to determine the required Safety Integrity Levels (SIL).

- u. Based on the determined SIL requirements, the consultant shall perform detailed SIL calculations and select appropriate instrumentation and components to achieve the target safety levels for each Safety Instrumented Function (SIF). A practical and acceptable proof test interval shall also be considered during the SIL determination process.
- v. It is the consultant's responsibility to ensure the complete design and implementation of the required SIFs, ensuring that all associated risks are reduced to a level below the tolerable threshold.
- w. Preparation of MCC to DCS/PLC interface signal details
- x. Details of Third-party communication interface to DCS system
- y. Detail engineering for ensuring cyber security requirements as per IEC 62443 for OT systems
- z. INSTRUMENT DATA SHEETS

Process data sheets for all instruments covering all instrument loops (open or closed and field or control room) indicating main components, operating conditions, special conditions, etc. Instrument list with process data (tag no., min. Value, low and high alarm limits, engineering units) shall be supplied in the package. Each control valve, safety valve and analyzer will be specified on an instrument process data sheet. The ultimate instrument design conditions shall be verified and confirmed by detailed engineering contractor during project implementation phase.

For the specific types of instruments, following minimum information shall be provided in the Instrument Data Sheet:

i. CONTROL VALVES

Tag number, location, flow rates (minimum, normal and maximum), sizing pressure drop, density and viscosity for liquids, molecular weight and compressibility factor for gases, whether liquid is congealing, operating & mechanical design conditions, air failure position, control valve size, mechanical limit stops (if applicable), spring action, smart positioners (FF / NFF), etc.

ii. SHUTDOWN VALVES

Tag number, location, operating & mechanical design conditions, air failure position, mechanical limit stops (if applicable), action, quick opening/closing requirement (if applicable), leakage class, limit switch requirement (if applicable), etc. Partial Stroke Test (PST) function shall be considered for critical/identified Shutdown valves.

iii. SAFETY/ RELIEF VALVES

Tag number, location, sizing flow rates, set pressure, operating & relieving conditions, allowable over pressure, density and viscosity for liquids, molecular weight and compressibility factor for gases, whether liquid is congealing, estimated valve size (to be finalized by detailed engineering contractor), etc. In the case of flashing liquid discharges, outlet condition liquid and vapour flows and physical properties will be provided for the project specified superimposed back pressure.

iv. ANALYZERS

Tag number, location, type of analyser, composition of fluid to be analysed, physical properties to be analysed, ranges of measurement, density and viscosity for liquids, molecular weight and compressibility factor for gases, operating & mechanical design

conditions, alarm set point, control set point, etc. Composition of the fluid shall be indicated in terms of mol% for vapours and wt% for liquids. Type and details of on-line analyzers and their desired range of measurement during normal operation, catalyst regeneration, start-up etc. should be clearly mentioned.

v. TEMPERATURE AND PRESSURE INSTRUMENTS

Tag number, location, ranges, fluid properties data, operating & mechanical design conditions, alarm set point, control set point, etc.

vi. FLOW INSTRUMENTS

Tag number, location, flow rates (minimum, normal & maximum), allowable pressure drop, density & viscosity for liquids, molecular weight and compressibility factor for gases, whether liquid is congealing, operating & mechanical design conditions, alarm set point, control set point, recommendation for type, etc.

vii. LEVEL INSTRUMENTS

Tag number, location, upper and lower fluid density & viscosity, whether fluid is congealing, operating & mechanical design conditions, alarm set point, control set point, etc.

viii. WIRELESS INSTRUMENTATION

Tag number, location, service (Pump Seal, Exchanger, AFC, corrosion, steam trap leak), ranges, fluid properties data, operating & mechanical design conditions, alarm set point, conditioning monitoring software, etc.

ix. OTHER MISCELLANEOUS INSTRUMENTS

Tag number, location, process performance specifications and fluid properties as relevant including physical properties, operating & mechanical design conditions, alarm set point, control set point etc.

aa. GENERAL INSTRUMENT SPECIFICATIONS

- i. Centralized control center shall have DCS to support HART and Foundation Field Bus (FF Bus) technology. Only open loop Instruments required for indication purposes shall be compatible with FF Bus technology with digital signal processing.
- ii. Instrument Technical specification and Instrument data sheets shall be provided in BDEP according to HART/FF Bus technology. HART protocol instruments shall be used for ESD, Fast loops like compressor controls, Critical process loops in general for all closed loops, fixed type gas detectors and all type of analyzers.
- iii. Design of Instrumentation for modification / revamp / augmentation of existing units shall be in-line with existing instrumentation of respective units.
- iv. Advanced process controls as required for the process are to be incorporated.
- v. Functional Schematics for Complex schemes with complete description and write-up shall be provided.
- vi. To carry out adequacy check of the existing DCS/ ESD system for integration of OSBL instrumentation to other plant DCS/ESD, wherever required and recommend required augmentation.

- vii. Mandatory Spares details as per project spare philosophy shall be clearly specified in MR and PR documents for field instruments including control valves, analyzers and for Control systems and verification of the same shall form part of Inspection dispatch clearance from consultant.

viii. Smart Plant Concept

- Intelligent P&ID with seamless integration to 3D Modelling database. All P&IDs shall be developed as Intelligent P&IDs with required database. These Intelligent P&IDs shall be linked with Editable 3D Model. It shall have facility to navigate from Intelligent P&ID to 3D Model and vice-versa. Licensor may provide SEED files of P&IDs developed in Intelligent P&ID showing process equipment, piping with line sizes, essential instrumentation, piping classes, insulation and heat tracing.
- Electronic Project Data and Document Management System for smooth hand over of data and flow of information amongst different package vendor.
- PROCESS: Handheld devices for field data monitoring (PI, TI, Vibration and Amps) using RFID and wireless gateway.
- Information System
 - Artificial Intelligent based application for Pump Healthiness monitoring and Exchanger fouling status.
 - Firewall and IT security for DCS/PLC systems and Infrastructure

2.8 ELECTRICAL

GIS- Gas insulated Switchgear

AIS- Air insulated Switchgear

EHV- Extra high voltage

HV/HT- High Voltage/High Tension

LV/LT- Low voltage/Low tension

DC- Direct Current

AC- Alternating current

SLD- single line diagram

DG- diesel generator

UPS- Uninterruptible power supply

CEA- Central Electricity Authority

FA- Fire alarm

SD- smoke detection

VFD- Variable frequency drive

APFC- Automatic power factor correction

FLP- flameproof

ECS- Electrical control system

EMS- Energy Management System

MCC- motor control center

PCC- Power control center

ASB- Auxiliary supply board

LDB- lighting distribution board

ELDB- emergency lighting distribution board

EOT- Electric overhead traveling crane

PA system- Public Address system

CONSULTANT shall undertake the following electrical engineering work including designing, reviewing, preparation of MR's, tendering and execution:

- a. All the electrical equipment has to be energy efficient and standardization to be kept in mind while selecting.
- b. Construction power requirement.
- c. Undertake all activities to make power/emergency backup power available from the refinery to new facilities.
- d. Reviewing of vendor list.
- e. Design of ECS and EMS and it's integration with systems of existing complex
- f. Interconnection of existing plant communication, Fire alarm and Telecommunication system with proposed new system. Sizing and selection of equipment for the Substation and process area, engineering for procurement, Testing and inspection at the manufacturers works, supply at site including commissioning of these equipment.
- g. Preparation of MR for electrical equipment like Transformers, MCC, PCC, UPS, VFDs, ASBs, LDBs, ELDBs, Energy saver panels, Thyristorised Electrical Heater Panels, Electric Heaters, Battery, charger, HT/LT switchgears (GIS/AIS) and Bus duct, Communication system, Neutral earthing Resistor variable Speed drives, Electrical Actuators (MOVs) / Electrical ROSOVs, bulk MTO (like cables, lighting fittings etc.) etc. including all other equipment and material related with electrical job.
- h. Design and preparation of MR for FLP Electrical Traction Lift etc. and preparation of Data Sheets
- i. MR of EOT if not covered in Mechanical.
- j. Review of Vendor drawings, inspection at vendors works.
- k. Schedule for Material take-off for the bulk material (MTO).
- l. Extension of HT/LT Switch gear if any.
- m. Emergency lighting and DC lighting of units and substation.
- n. DC Battery bank / Battery Charger and DC Supply network.
- o. DG set including its integration for meeting emergency requirements if required.
- p. Cable network for ECS and its continuity between sub stations / field equipment.
- q. Fireproofing of cables in switchgear, cable galleries and exposed cable above ground up to motor terminal box in units including fireproofing of bottom portion of HT & LT switchgear in substations.

- r. Relay coordination of new electrical equipment's including coordination with existing upstream system.
- s. Designing of HVAC system of control room / substation /SRR and its inter connection with the Fire alarm system for safety.
- t. Design and installation of fire protection facilities such as smoke detectors, manual call points in plant as well as buildings i.e. sub-station, SRR, control room and integration of new FA system with existing FA network of Refinery.
- u. Commissioning assistance and troubleshooting of electrical equipment during process plant commissioning.
- v. If any facility is installed adjacent to an existing REFINERY facility, area classification of existing facility also needs to be reviewed and recommendations to be given if necessary for any changes in equipment.
- w. Irrespective of vendor prepares SLD or not, Consultant shall prepare SLDs of all switchboards at all voltage levels and shall be submitted to OWNER in editable AutoCAD format so that future modifications done by OWNER can be incorporated.
- x. Prepare detailed specification for all electrical equipment required to be installed for completion of project
- y. Designing of electrical equipment (Rating of HT / LT switch board, Transformer capacities and loading of and motor).
- z. Substation equipment layout drawings.
- aa. Emergency Power network for project including DG set and hook up with existing electrical system.
- bb. Preparation of all cable route and layout drawings, clearly indicating overhead and underground cable routings.
- cc. Lighting layout and welding receptacles layout for units as well as Substation building, SRR and control room.
- dd. Preparation of Cable Schedule for all types of cables.
- ee. Preparation of Cable tray schedule
- ff. Preparation of Motor Data Sheets and motor load list summary.
- gg. Preparation of Data sheets of all electrical equipment's.
- hh. Design of Communication system.
- ii. Area classification for erection of various electrical equipment, fittings and accessories.
- jj. Equipment layouts showing location of the electrical equipment
- kk. Earthing layout for all electrical equipment and static process equipment as per statutory guideline.
- ll. Design and arrangement of lightning protection, for electrical, process equipment, buildings etc. wherever required.
- mm. Standard installation drawings for power, lighting and earthing installation.
- nn. Preparation of the working drawings for installation of various equipment

- oo. Specification for complete electrical installation work with schedule of quantities.
- pp. Junction Box Schedules.
- qq. Designing of protection system for all electrical equipment like Transformer, motors etc. including distribution system equipment and any other system related to this work.
- rr. Preparation of cable schedule, control schematics and inter connection charts.
- ss. UPS supply network.
- tt. Interconnection diagrams between DCS and MCC for instrumentation logics.
- uu. Design of cathodic protection system
- vv. Design of Heat tracing system and preparation of layouts
- ww. Block diagrams for LAN network system of Substation and SRR/Control room and its integration with existing system.
- xx. Submission of final as-built drawings of all electrical related facilities like sub- station equipment layout, overall/ detailed cable layout, lighting layout, PA and FA layout, earthing layout etc.
- yy. Submission of all the test reports, commissioning reports, lux level report, earthing value report etc. for electrical related facilities of the project.

2.9 CIVIL ENGINEERING

CONSULTANT shall carry out following civil WORK:

- a. Carry out technical evaluation of offers and prepare recommendations
- b. Review and approve vendor/contractors' drawings
- c. Design of pavement for operating areas.
- d. Vendor drawing review, approval and QAP approval.
- e. Detailed estimate of all work tenders.

2.10 STRUCTURAL & ARCHITECTURAL ENGINEERING:

CONSULTANT shall carry out following structural and architectural engineering work:

- a. Design of buildings.
- b. Design of foundations for various equipment.
- c. Preparation of equipment foundation drawings, piling Specifications and drawings.
- d. Preparation of Ladder & Platform and Pipe Racks Drawings for equipment, technological platform and other operating and access platforms including interconnecting platforms and platforms required for operation and maintenance of valves etc.
- e. Cable Trench Design/ Drawing.
- f. Preparation of miscellaneous foundation drawings such as pipe Supports foot.
- g. Design of structures of installation of various equipment and technological platforms attached to various equipment.
- h. Preparation of Architectural drawings, detailed plans, elevations and sections, details of toilets, stair-cases, false Ceiling, doors, windows and furnishings.

- i. Preparation of material take-off for structural steel, reinforcement and cement.
- j. Material take off and preparation of specifications for architectural Items.
- k. Preparation of specifications for all structural construction work and tender specifications with schedule of quantities and tender drawings.
- l. Review and approval of vendor/ contractor drawings for critical structural work wherever required.
- m. Detailed estimate of all work tenders.

3.0 PROCUREMENT AND CONTRACT SERVICES

Consultant shall perform the following services for procurement of all indigenous & imported equipment and materials except for package & composite contracts and civil constructions contracts viz equipment and bulks under the packages and materials like Civil items- sand, cement, reinforcement bars, steel structure, fireproofing material, aggregates, bricks, timber etc. electrical items: light fitting, junction box and cable boxes etc., instrument items; GRP / FRP cable trays/cable ducts and any other material, fitting, fixtures which would be supplied by concerned construction contractors. All procurements/contract services shall be processed including floating of e-tenders by consultant. The services shall be as per the approved purchase / contract procedure issued by the OWNER and agreed by CONSULTANT.

- a. Prepare tendering procedure for procurement and contract services and subsequently obtain BPCL's approval for the same.
- b. Provide services for procurement of goods and services for all items for implementing the project.
 - i. Preparation of the Vendor list indicating name, address & telephone numbers etc. required for the procurement of different type of material. (List of vendors recommended by licensor wherever applicable in BDEP for certain critical equipment has to be followed.) List and schedule of Material requisitions / Tenders / Drawings to be frozen within two months from the effective date as mutually agreed by BPCL. Vendor list prepared & recommended by the CONSULTANT shall be reviewed & approved by the OWNER. OWNER shall have right to include approved vendors for different category of equipment based on performance records. In case of inability to source equipment from approved vendor list, vendor list suggested by the Consultant shall be used after approval by BPCL. CONSULTANT shall include in the PACKAGE bid the Licensor's vendor list for critical equipment if any recommended by licensor. CONSULTANT shall prepare and include the vendor list in the all package/works and LSTK contracts.
- c. Preparation of specifications, material take-off of all the materials to be procured including material take-off which will be procured by the contractor.
- d. Prepare RFQ documents / tender documents, invite e-quotations for materials (both indigenous and imported items) and contracts (both indigenous and imported services) and forward award recommendations to BPCL for placing orders. Prepare cost estimate of procurement & service tenders and provide back up of cost estimate.
- e. Preparation of item wise detailed cost estimate and same shall be forwarded to BPCL for procurement and contract services.

- f. Co-ordinate and attend pre-bid meetings with vendors as per requirement and reply to bidders queries in an agreed time schedule. Expedite responses from bidders for TQ/CQ's raised during the tendering activities.
- g. Preparation of enquiries along with General Purchase/ Site works conditions, agreed terms and conditions of OWNERS calling quotation for equipment, machinery, material and services on behalf of the OWNER.
- h. Preparation of Addendum, if any., Co-ordinating & expediting with bidders for early TQ/CQ responses after opening of bids, negotiation responses if any.
- i. 'General Purchase Conditions' and 'General Conditions of Contract' of BPCL shall be an integral part of all tenders, as the case maybe i.e. procurement or contract respectively. SCC/SPC shall be prepared by the Consultant for works contracts/procurement of materials covering special requirements of the project in consultation with BPCL.
- j. The Consultant shall provide detailed estimate before floating of tenders. The Consultant to ensure all estimates are realistic and based on updated inputs and with back up for all cost estimates.
- k. Consultant shall receive technical and commercial bids and after receipt of bids, consultant shall open the technical bid and proceed with evaluation. Consultant will correspond and conduct meeting with bidder (s), resolve unpriced technical and commercial queries and recommend BPCL for opening the price bid of techno- commercially acceptable bidders. On receipt of recommendation for Price bid opening from consultant, BPCL will give approval for opening of price bids. Consultant will then open the Price bid. Consultant after evaluation of price bids will send award recommendation to BPCL for Award of the job. BPCL will conduct negotiation if required. Consultant will assist BPCL during negotiation.
- l. BPCL will place purchase orders on technically and commercially acceptable vendors, with intimation to the Consultant.
- m. Prepare draft Letter of Acceptance (LOA), Detailed letter of acceptance, Agreement, Detailed Purchase Order along with all enclosures, statement of agreed deviations (if any) and Order Amendments (if required).
- n. Provide services for re-floating / re-tendering for purchases, if required without any extra cost.
- o. The Consultant shall include in Purchase Orders and contracts a requirement for guarantees from material suppliers, contractors and package vendors against defective material or poor workmanship, and the Consultant shall assist BPCL in the enforcement of such guarantees. The Consultant shall obtain documents from suppliers, contractors and package vendors etc. in the prescribed format and submit them to BPCL.
- p. Issue of the enquiry to the approved vendors against each MR and OWNER's decision on the addition and deletion of the Vendor will be final.
- q. Detailed procurement/ storage procedure to be prepared by the Consultant for OWNER's approval and procedure approved by the OWNER with or without modification shall be final.
- r. QAP approval shall be done by Consultant for procurement of all the items but for bulk items, necessary QAP shall be issued in the enquiry itself by the EPCM and the vendor shall follow it.
- s. Issue of Standard approved QAP for the bulk items like pipes, fittings, flanges, cables etc.

- t. Life cycle costing as well as energy efficiency to be considered at Equipment Selection stage.
- u. Follow-up and liaison with equipment vendors for clarifications of technical details and approval of drawings, wherever required. In case of any deviations, BPCL's consent to be taken.
- v. Certify after thorough scrutiny extra claims if any by contractors and submit their recommendation complete with rate analysis to BPCL for approval and to effect payment.
- w. Initiate procurement action for replacement of shortage/damaged items of indigenous / imported purchase orders.
- x. The Consultant to render their service for lining up agency for route survey and transportation of major equipment, Modular sections and Over Dimensional Consignments / Overweight Consignments up to the work site. Consultant shall participate in route survey along with the agency, supervise the route survey, examine the report and recommend it to OWNER.
- y. In case of any damage to the equipment during transportation, the Consultant shall depute their Engineers / inspectors / specialists etc. for carrying out necessary study to assess the damages and implement recommendation for rectification, if required.
- z. Consultant shall coordinate and provide all support for taking up insurance claims etc. as required
- aa. Consultant shall resort to lining up of rate contracts for supplies/generic services required for the Project to the extent possible.
- bb. Consultant shall resort to providing composite works contracts to the extent possible after analyzing the Pros and Cons and provide the same for BPCL's review and approvals.
- cc. The cycle time for completion of each intermittent activity up to ordering will be in line with the best international practice to be mutually agreed by BPCL & Consultant.
- dd. Consultant shall assist in execution of the agreements after placement of orders, maintenance of EMD (including return of the same)/ assist in obtaining BOCW – (Building and other construction workers) License.
- ee. Consultant shall incorporate applicable changes in Guidelines/statutes in the tenders/evaluation process from time to time as per requirements and as stipulated by Government policy changes.
- ff. The Consultant to render their service for lining up agency for route survey and transportation of major equipment and Over Dimensional Consignments I Overweight Consignments up to the work site. Widening of roads, strengthening of bridges, getting the necessary approvals, construction of temporary jetty etc. are also to be included in the scope of the agency.
- gg. Consultant is the nodal agency for expediting material delivery in line with schedule. Consultant shall arrange for taking up mitigating measures and actions to salvage situations of vendor failure at no extra cost to BPCL.
- hh. Consultant shall advise/arrange for offloading, other measures to be taken for smooth progress of contracts in line with BPCL guidelines and after approval from BPCL.
- ii. On completion of works consultant shall forward detail closure recommendation for each contract consisting of below minimum documents in the format acceptable to BPCL.
 - Statement of variation (Excess saving statement)
 - Reasons for variation in executed quantities as against estimated quantities

- Completion Certificate
 - Reasons for delay in completion if any supported by hindrance register including recommendation with respect to applicability of LD
 - No Claim Certificate, Site Clearance Certificate, Labor liability certificate from Contractor
 - No Dues certificate, Indemnity bond and proforma invoice
- jj. Procurement of all firefighting equipment and other equipment such as fire trucks/foam/SCBA/miscellaneous equipment required for fire crew as mandated by statutory authorities/ as per requirement of BPCL. Procurement of all safety items such as portable gas detectors etc.
- kk. Material inspection outside India (foreign vendor material inspection) shall be carried out by third party & charges for the same shall be borne by the respective contractor on which order is placed. Based on the criticality and requirement as agreed between BPCL/Licensors/Consultant, foreign inspection shall be done by consultant/BPCL as needed and separate charges as per price schedule shall be paid to the consultant. It will not be part of lump sum scope. However, for within India, Inspection will be in scope of consultant and part of lump sum scope.
- ll. Procurement of all other miscellaneous elements as required in the project for smooth and safe start up and commissioning of Project. Procurement of mandatory spares / other items required for smooth pre- commissioning/commissioning / startup / operation of the plant.
- mm. Consultant shall provide all assistance and back up documents in case of any Arbitration/ CTE enquiries etc. for a period of at least 5 years from Project Completion. All documents as required shall be provided by the Consultant as requested by BPCL.
- nn. Assist BPCL in arbitration cases (wherever required) for a minimum period of 36 months from the date of last contract closure in their scope. For such services the consultant shall be paid Manday charges as per Schedule of Prices; and the travelling and accommodation charges shall be to BPCLs account.
- oo. Consultant shall perform services for following activities in the warehouse in BPCL's SAP system:
- i. Data entry for GR in SAP
 - ii. Receipt & acceptance of materials in SAP
 - iii. GR processing
 - iv. Issue/ return of material in SAP.
 - v. Reconciliation of warehouse material.
- pp. Consultant shall reconcile all bulk materials and shall give a comprehensive report to BPCL for review.
- qq. Consultant shall provide all documents, recommendations for closure of contract (Indigenous and imported) with all supporting documents as required.
- rr. Consultant shall maintain a dashboard for capturing continuous status Updation and monitoring of all procurement activities.

- ss. Consultant shall provide all data as required for providing to the ministry/other agencies/RTI etc. as sought by BPCL within the prescribed time frame.
- tt. Consultant shall assist and provide documents/replies as sought by CTE/ other agencies. All amendments to government policies and procedures/as required by BPCL shall be incorporated by the Consultant without any additional cost.
- uu. Apart from above, Consultant shall possess/ develop proper systems to monitor the contract progress and to intimate necessary corrective action to ensure health monitoring of contracts to avoid any delay in project execution. Gist of the major activities envisaged under the same is as below:
 - i. Assist/Guide to handle commercial related pre-bid queries/deviations.
 - ii. Review and monitor work front availability.
 - iii. Review of mobilization of manpower & machinery by contractor as per the contract condition.
 - iv. Review contractor's schedules for manpower, material, jobwise completion including anticipated hurdles in meeting the target completion.
 - v. Change order management and dispute resolution.
 - vi. Handle issues like offloading, risk purchase, termination, holiday listing etc.
 - vii. Continual Evaluation of Contractor's performance
 - viii. Physical progress of work- schedule vs. actual
 - ix. Financial Progress of Work- schedule vs. actual
 - x. Front availability
 - xi. Quantity variations
 - xii. Contract value variations including AHR item quantity variations
 - xiii. Time overruns
 - xiv. Any contractual issue and measures to tackle the same.
 - xv. Expediting and follow up activities, including sub-contractor monitoring.
 - xvi. Maintain important contract documents.
- vv. To process closure proposals in an expeditious manner, following relevant documents shall be maintained and provided to BPCL.
 - i. Contract Agreement - The official contract document outlining terms, conditions, deliverables, and responsibilities of contractor and client.
 - ii. Change Orders - Records of any changes to the original contract, including formal change orders, approvals, and associated documentation.
 - iii. Payment and Invoicing Records - Invoices, receipts, and records of payments made and received, ensuring financial transactions are accurately documented.
 - iv. Progress Reports- Regular reports on project progress, milestones achieved, and any issues or delays encountered in the form of hindrance register.
 - v. Quality Assurance and Acceptance Criteria - Documentation related to quality standards, testing procedures, and acceptance criteria for deliverables.

- vi. Meeting Minutes - Records of meetings, including discussions, decisions, and action items, to track the progress of the contract.
 - vii. Compliance Documentation - Documents demonstrating compliance with legal, regulatory, and contractual requirements.
 - viii. Final Inspection Records - Records of any final inspections, verifications, or audits conducted to ensure contract compliance.
- ww. Consultant shall keep a backup of all the documents (even if the same has been provided to BPCL) and the same shall be provided to BPCL again if sought for. Not limited to the above, all other services towards completion of the procurement of goods and services and closure of the contracts/orders and handling arbitrations/complaints and complete handling of the order/contracts etc. not specifically mentioned hereof but shall be required in line with policies and procedures shall be carried out by the Consultant. Assist BPCL in arbitration cases (wherever required) for a minimum period of 36 months from the date of last contract closure in their scope. For such services the consultant shall be paid Manday charges as per Schedule of Prices; and the travelling and accommodation charges shall be to BPCLs account.

xx. MISCELLANEOUS PROCUREMENT ACTIVITIES

- i. Review and recommend for OWNER'S approval all procurement forms and procedures.
- ii. Review of purchase orders and purchase requisition to be issued for major and critical equipment to ensure proper/complete documentation, compliance with the Project specification, spare parts and other specific requirements.
- iii. Review and recommend for OWNER'S approval the material movement and handling procedures proposed for the Project.
- iv. Review, analyze and recommend purchase orders for quoted delivery dates to ensure compatibility with the approved Project schedule and ability to meet site material requirements during the construction phase.
- v. Closely monitor actual delivery dates and ensure adherence to expediting functions and prepare plans for remedial actions in case of any delay foreseen in delivery of equipment/material.
- vi. Ensure that the inspection and quality assurance programs are being followed and that proper documentation is provided for all equipment and bulk materials.
- vii. CONSULTANT shall audit the essentiality certificates (EC), if applicable, issued to various vendors to ensure that certificates have been utilized for importing the correct material.
- viii. CONSULTANT shall give a recommendation on contractor's request for issue of Essentiality Certificate (if applicable).
- ix. Expediting the critical materials by visiting the vendor shops (Indian). A report on each visit will be generated & submitted to the OWNER. A consolidated monthly progress report shall be generated by the Consultant regularly.

- x. Require the immediate reporting to BPCL of all changes which will affect material quality and recommend any necessary corrective actions to be taken.

4.0 WAREHOUSE/STORES MANAGEMENT

- 4.1 Finalization of store requirement and lining up of agency for Construction / Modification of project stores with infrastructure for storing /handling the material of different categories and managing the store.
- 4.2 Lining up of an agency for transportation of material from transporters to Project store/ site.
- 4.3 The following are the scope of the work under the Stores Management for Consultant:
 - a. Receipt of the documents from Bank/ Finance Dept.
 - b. Collection of materials from Railway, Transportation, Godown etc.
 - c. Receipt and accounting of material at Stores.
 - d. Checking and arranging of the inspection of the material wherever required including PMI.
 - e. Lodging insurance claim for short receipt & breakage etc.
 - f. Codification, Storing & Stacking of the material at the proper place.
 - g. Preservation of material
 - h. Maintain record of issue, receipt & balance material.
 - i. Settlement of insurance claims including their follows up etc.
 - j. Handing over left over material to BPCL along with test certificate and other documents.
 - k. Special care for the systems having sophisticated items like microprocessors based electrical and electronic controls, DCS/PLC cards, special instruments, electronic smart positioners and other high value instrument items.
 - l. Handling of stores strictly as per the existing practices on SAP.
 - m. Co-relating dispatch document with the material received at site like Inspection release note issued by TPIA as per requirement. The materials test certificates are in order or not etc.
 - n. Verifying the bill of materials (BOM)/packing list on arrival and checking vendor documents for completeness, advice OWNER for release of Payment.
 - o. Follow-up with transporter for delivery of materials after dispatch.
 - p. For shortage and damage follow up with Vendor/ insurance company etc.
 - q. Preparation of daily, weekly materials receipts status and materials shortage reports.

5.0 EXPEDITING SERVICES

CONSULTANT shall perform the Expediting services of all equipment and materials. For materials expediting shall be carried out by the CONSULTANT and shall inform / send the correspondence details like drawing approval etc. with Supplier as when occurred without fail. The services will include:

- 5.1 Expediting actions for all purchase orders covering equipment and materials and liaison with vendors.
- 5.2 To interact with the Senior Management/shop floor/planning personnel / procurement person as required and to make a factual status/report and send the same to OWNER.
- 5.3 Issuing weekly/ monthly expediting report from the first order issued. The reporting should start as soon as the first order is issued. The report will highlight wherever shortcomings there are like design approval, material procurement etc. including action taken with targets. A standard format to be agreed upon during the kickoff meeting with CONSULTANT.
- 5.4 Dedicated qualified experienced manpower shall be deployed at the major centers for expediting services. If required dedicated manpower will be positioned at the vendor works also.
- 5.5 Expediting services of equipment (to be imported) shall be carried out by CONSULTANT.
- 5.6 Co-ordination of the activities of vendors and transporters by maintaining regular contact with them for transportation of materials till the materials are received at site.
- 5.7 Coordination with vendor for freezing design input.
- 5.8 Coordination with vendor for dispatching the materials.
- 5.9 Digital technology is to be employed as given below:
 - a. Real-time availability of yard-wise inventory & in-transit
 - b. Implement WMS (Warehouse Management System - SAP WM, Oracle WM, Blue Yonder or equivalent) to efficiently manage and track inventory within warehouses.
 - c. Receiving, storing, and issuing materials, optimizing space, and reducing errors in manual data entry.
 - d. Streamline the order fulfillment process, ensuring the right materials are picked, packed, and delivered to the construction site promptly.
 - e. Implement TMS (Transportation Management System - SAP TM, Oracle TM, Mercury Gate or equivalent) to:
 - f. Optimize transportation routes for delivering materials to and from the construction site. This reduces transportation costs and minimizes delays.
 - g. Provide real-time visibility into the movement of materials, allowing project managers to track shipments, monitor delivery times, and respond promptly to any deviations from the plan.
 - h. Implement a centralized data platform or integrate a system into BPCL's ERP (Enterprise Resource Planning) system.
 - i. Regularly update and train staff on the use of these technologies to ensure effective utilization.
 - j. The Consultant will deploy RFID (Radio-Frequency Identification) system for real-time tracking of items as they move through various stages of construction by embedding RFID tags on equipment, components, and materials.
 - k. The Consultant will ensure the integration of these technologies to create a comprehensive ecosystem that enhances efficiency, minimizes errors, and provides real-time insights into the progress and logistics.

1. Tools will have to be within the options described in Chapter 2. The Consultant can suggest preferences, but the final decision lies with the OWNER. The solutions should be compatible and need to integrate with CDE (common data environment) and control tower. Provide training sessions to ensure proficiency for the tools.

- 5.10** The Warehouse/Stores Management shall be done by the CONSULTANT as per the scope mentioned above. The CONSULTANT shall carry out Quarterly Audit of the Warehouse Management for the PROJECT and shall reconcile the material receipt and Materials issued / consumed. The CONSULTANT shall investigate and promptly furnish to BPCL, a written narrative of all incidents of loss, damage, destruction, or theft, as soon as the facts become known irrespective of a request either made or not made by BPCL.
- 5.11** The CONSULTANT shall be responsible for lining up and managing agencies towards security and watch & ward of Warehouses/ Materials Stores for the PROJECT. However, the cost of such security and watch & ward contract shall be borne by BPCL. In case of any loss due to reasons attributable to CONSULTANT and/or theft for which FIR is either registered or not, the same shall be either made good by the CONSULTANT or its cost will be recovered from CONSULTANT. In case of any other loss, the CONSULTANT shall co-operate with and support OWNER with all procedures and documentation, including, but not limited to filing of Police FIR, required for lodging insurance claims.
- 5.12** Notwithstanding anything to the contrary in this agreement, if the CONSULTANT cannot establish by clear and convincing evidence that the loss, damage, destruction or theft (for which FIR is either registered or not) has not occurred due to fault of CONSULTANT, the CONSULTANT shall be held liable to make good of any losses and also keep the OWNER indemnified from and against all losses and damages and cost, charges and expenses and penalties, actions, claim, demand and proceedings whatsoever suffered or incurred by or against the OWNER.
- 5.13** The CONSULTANT shall at all-time be exclusively responsible for providing all services from issuing of stock loss material's MR to receipt and its management at site irrespective of whether it is on account of their fault or not and/or due to theft.
- 5.14** The deductibles on account of Excess clause shall be borne by the CONSULTANT for the stock loss due to the reasons attributable to CONSULTANT and/or theft for which FIR is either registered or not. The Excess shall be applicable per event per insured.

6.0 INSPECTION

- 6.1** Detailed scope of Inspection and list of items required to be inspected should also be furnished by the CONSULTANT.
- 6.2** Inspection of materials/ equipment procured by OWNER/ Contractor is under the scope of the Consultant which shall be carried out by CONSULTANT for all indigenous and (including packages and globally tendered items). Inspection by TPI acceptable to OWNER imported items
- 6.3** Inspection of materials at site, inspection of Construction Work shall be carried out by the Consultant.
- 6.4** CONSULTANT shall prepare the inputs for complete Inspection and Quality Assurance Program of the Project, which will provide OWNER with acceptable and quality products. The Inspection test plan/ QAP shall include all the items (including non-critical items like CS fitting) to be procured by the Contractors. Additionally, the Inspection test plan/ QAP shall have the provision of 10% dimensional checks of each size, pressure rating and type of pipe fittings at vendors' works by

CONSULTANT and surprise checks at site by the OWNER. This Inspection test plan/ QAP shall be included in the PACKAGE bid.

6.5 CONSULTANT will review and recommend to OWNER for approval the above QAP/ inspection test plan which as a minimum shall include:

- a. In-house inspection programs.
- b. Inspection procedures consistent with mandatory codes.
- c. Procedures for material identification and transportation.
- d. Certification of non-destructive testing.
- e. Independent inspection of all critical equipment at vendor's works (with approval of OWNER) and issue inspection reports along with factory acceptance test reports to OWNER.
- f. Certify invoices submitted by PACKAGE Contractors.

6.6 CONSULTANT have to perform the expediting and follow-up job with vendors for critical items.

6.7 Detailed scope of Inspection and list of items required to be inspected should also be furnished by the CONSULTANT. Inspection of indigenous items under EPCM Part to be done by consultant Directly only and not through any other subcontract/TPI. It is clarified that TPI shall be included in the scope of the bidder in case of imported items only. The same shall be obtained along with their offer. Inspection Charges for imported items to be borne by Material suppliers to Third party Inspection Agency. Inspection of all Long lead Items (LLI) inspection in India and at site are included in the scope of EPCM.

6.8 Inspection of materials/ equipment including equipment spares as per spare philosophy procured by OWNER/ Contractor is under the scope of the Consultant which shall be carried out by CONSULTANT for all indigenous and imported materials (including packages and globally tendered items). Inspection by TPI acceptable to OWNER for imported items.

6.9 Inspection of materials at site, inspection of Construction Work shall be carried out by the Consultant.

6.10 Irrespective of mentioned anywhere in the tender bidders to note that quality assurance and inspection is in the scope of consultant for all indigenous procurement and site activities. TPI will not be allowed for any type of services or procurement job within India. TPI will be allowed only for procurement of imported items at vendor's workplace in foreign country.

6.11 On material receipt at site, OWNER shall cross-check & record inspection of the identified critical material in Material Receipt Report (MRR) against defined check points in QAPs / ITP, on sample basis. However, the above checks by OWNER will not absolve CONSULTANT from their responsibilities towards material inspection as specified elsewhere in the tender document.

6.12 Digital Quality Inspection:

- a. Document detailed SOPs for each inspection process, ensuring clarity and consistency in procedures. Ensure SOPs adhere to international quality standards relevant to oil and gas industry.
- b. Develop comprehensive plans outlining the specific tests and inspections required at different stages. Incorporate internationally recognized quality metrics and criteria into the plans.

- c. Design digital forms and checklists that align with inspection requirements. Include fields for capturing essential data, observations, and deviations.
- d. Utilize dedicated software or platforms for data capture, storage, and analysis, compatible with EDMS. Choose solutions that offer real-time update and collaboration, ensuring efficiency in communication.
- e. Comply with international data protection regulations and standards to ensure inspection data safety.
- f. Provide thorough training for inspectors on the use of digital tools and adherence to updated processes. Regularly update training programs to keep inspectors informed about changes.
- g. Maintain detailed audit trails for each inspection, ensuring transparency and traceability. This helps in tracking any changes made during the inspection process.
- h. Adhere to international documentation standards for quality management systems. Ensure that all digitized documents meet these standards for consistency and compatibility.

6.13 The solutions should be compatible and need to integrate with CDE (common data environment) and control tower. Provide training sessions to ensure proficiency for the tools.

7.0 EXECUTION

7.1 The CONSULTANT shall have the responsibility of managing, coordinating and executing the work assigned by OWNER. A full time Project head assisted by respective Project Managers will be assigned to liaison with the Vendors/ contractors and will be responsible for all aspects of job execution including safety. He will ensure all necessary co-ordination, flow of information and timely issue of design documents and drawings. Regular Progress Reports will be issued to OWNER highlighting progress achieved, major milestones, areas of concern and actions required.

7.2 All design and engineering works will be carried out from the offices of the consultant. A review Board consisting of Senior Management personnel from the CONSULTANT will be formed to ensure that proper quality, safety and progress of work for the assigned job is maintained.

7.3 The CONSULTANT must position competent persons at site office to facilitate smooth correction of drawings as well as for co-ordination of jobs.

7.4 Check dimensions on final assembly and witness unit test/performance test/shop test.

8.0 CONSTRUCTION MANAGEMENT AND SUPERVISION

8.1 CONSULTANT shall supervise construction WORK for this project to be carried out by works contractors. The supervision of the Contractor's WORK shall be performed by CONSULTANT'S staff. During the progress of all WORK to be done at site, CONSULTANT shall keep a competent Engineer-in-Charge at site fully authorized to give and receive such orders as may be necessary for the proper performance of WORK.

8.2 CONSULTANT shall perform the following services for construction management and supervision, in accordance with the construction co-ordination procedure agreed with OWNER.

- a. Organize, plan, supervise and manage the construction activities as a whole. An Organogram comprising minimum technical persons of various disciplines at various phases of construction as agreed by OWNER must be maintained by the CONSULTANT

at site. Organogram of consultant at site to be given to OWNER for their review and approval.

- b. Co-ordinate, inspect and expedite the WORK of contractors in order to secure completion of contracts in conformity with plans, specifications and approved schedule.
- c. Final material reconciliation and closure of all the contracts at site.
- d. Check quality and quantities of work performed by contractors and maintain necessary records and certify Contractor's bills according to the conditions of contracts to enable OWNER to effect payments. CONSULTANT shall process the extra work/ other work claims and give recommendation to OWNER. Proposed recoveries from the Contractors against issue of materials, hire charges, rent etc. as per provisions in their respective contracts and perform all duties of the Engineer-in-Charge as per the respective contracts.
- e. Quality Control checks procedure in the bid to include:
- f. Pre-erection quality check carried out by CONSULTANT and if necessary, corrective action shall be taken by CONSULTANT.
- g. Quality check for all works but not limited to welder certification works procedure etc. till completion of the job.
- h. Certify quality and quantity of work performed by contractors and maintain necessary records required for certifying the contractor's measurements according to the conditions of contracts, propose recoveries from contractors
- i. against issue of materials, hire charges, rent etc. as per provisions in their respective contracts and perform all duties of the Engineer-in-Charge as per the respective contracts.
- j. Also deal with all construction agencies for expeditious settlement of extra claims, disputes etc. in consultation with OWNER.
- k. Preparation of progress reports, construction schedules, estimate for contract and other reports necessary for the orderly and speedy execution of the construction work.
- l. Receive equipment and materials delivered, inspect necessary and issue goods receipt vouchers, maintain physical records of stores at site, issue materials for construction and prepare goods issue vouchers thereof, arrange survey and prepare claims, on behalf of OWNER, pursue the same and on completion of the work, prepare conciliation to enable OWNER to check and take over the balance stores.
- m. Liaison with the OWNER'S field personnel and local authorities and complete dealing with all construction agencies for orderly and efficient realization of construction work during currency of the construction supervision services by the CONSULTANT.
- n. Arrange for the services of vendor's specialists as required, for satisfactory execution of erection, mechanical trial and commissioning. However, cost of such services shall be as per Purchase Order terms.
- o. Compilation of all lubricants and chemicals to be done by the consultant required for the plant.
- p. Spare part philosophy to be prepared by the consultant after discussion with OWNER considering BPCL spare philosophy.
- q. Check and ensure whether material has been procured by the Contractor from the OWNER's approved vendor.

- r. Site Inspection work of equipment & other works shall be performed by the Consultant.
- s. No supply shall be accepted unless drawings (wherever required) are approved and QAP must be approved.
- t. Payment to the Vendors shall be released only after receipt of Inspection note from the third party.
- u. Clearance for erection works/ installation of the equipment shall be given only after receipt of inspection note from the third party.
- v. Pre-commissioning/ commissioning of plant/ equipment shall be undertaken only after complete satisfaction/ verification of supplies as per final approved drawing under code-1 (Release for fabrication drawing) and QAP.
- w. Checking of piping materials at site received from vendors as per agreed procedure.
- x. Consultant shall maintain 'Hindrance Registers', as per OWNER's format, for delay in execution of contractor's jobs, to analyze their recommendations for time extension.

8.3 The following activities also form part of Construction Management and supervision:

- a. Consultant shall prepare construction quality assurance procedure to ensure their compliance with approved codes/standards/specification.
- b. Review/audit approved welding procedure & welder qualification procedure.
- c. Ensuring compliance with various statutory rules, regulations, and safety measures.
- d. Ensuring all necessary precautions has been taken to protect the material from damage.
- e. Develop proper storage facility & tools/tackles of Nuclear Instrument.
- f. Develop inspection testing procedure (ITP) of field instruments in consultation to OWNER & perform necessary checking. Review and approval of Manifold hook-up fit-up,
- g. Witness hydro test of impulse hook ups for all field instruments, NDT and approve all radiography testing for impulse hook ups, wherever required.
- h. Ensure all the installation of instruments is carried out as per approved Consultant drawing/documents/installation standards.
- i. Ensure all cable laying, cable duct/tray installation, steam tracing, impulse line preparation & other instrumentation job are being carried out as approved Consultant drawing/procedures/standards.
- j. Ensure smooth progress of all control room jobs including civil/electrical/instrumentation agencies involved in control room activities, including loop checking.
- k. Ensure proper supervision of all Analyzer and CCTV Installation & commissioning activities & involve dedicated experienced manpower in these activities.
- l. Ensure proper supervision of complete DCS/PLC system installation including panel erection, cable termination, loop checking, testing, control/interlock verification, daily progress monitoring and required report generation.
- m. All inspection report/files to be handed over to OWNER after one month of Mech. Completion.

- n. Arrangement of services for vendor specialist for construction activities of instrumentation item as required.
- o. Develop proper procedure & ensuring implementation for the same for installation and commissioning of nuclear instruments and other specialty instruments.
- p. 100% witness and certification of calibration of all field instruments and testing of safety relief valves.

8.4 The Consultant's RCM shall be stationed at site and shall have overall responsibility for the site. The RCM, supported by a team of adequate engineers (as detailed at the beginning of this clause) and administrative staff will supervise and direct the field technically and administratively. RCM will also arrange to direct the contractors to have adequate men and equipment to meet the overall construction schedule and prepare construction Progress Report/ Construction Schedule and other reports. The RCM shall

- a. Liaise with the Consultant's project office in order to ensure adequate & timely flow of drawings, data, equipment & material to the field and for engineering/Procurement related works.
- b. Convene review meeting regularly once in a week time or as per the requirement of the work site with BPCL and Contractors.
- c. Take part in the kickoff/review meeting with contractors/package vendors.
- d. The Consultant to arrange for direct handling of test coupons/cubes from the site to the authorized lab which are approved by BPCL. These shall not be handled by the contractors.
- e. Maintain the following registers / records and make available to OWNER as and when required.
 - i. Hindrance Register for each contract in BPCL approved format
 - ii. Measurement Book
 - iii. Site Order Book (SOB)
 - iv. Safety Register
 - v. Material issue registers.
 - vi. Radiography registers for each contract
 - vii. Manpower deployment registers for each contractor.

9.0 ARCHIVES MANAGEMENT

The CONSULTANT will have to perform management of archives including Documentation/ Drawings, Listing, Presentation, Updating of Drawings, indexing etc. and finally handing over to OWNER as defined in the scope document elsewhere in tender document.

10.0 SPARE PARTS MANAGEMENT

The following activities will be performed by the CONSULTANT:

- a. Checking and approving the quality and quantity of spare parts and other supplies to be made available by the Contractor(s) to ensure compliance with the construction contract requirements and supervision of their handing over to OWNER.

- b. Recommendations of spare parts inventory and future ordering schedule for safe conditions/trouble free operation.
- c. CONSULTANT will advise OWNER for establishing necessary Electrical Testing & Instrumentation lab with recommendations of appropriate testing equipment.
- d. CONSULTANT shall develop spare parts lists considering client's spare philosophy for Commissioning spares, Mandatory spares and Operation & Maintenance Spares for each equipment & piping system in consultation with OWNER for inclusion in bid document(s).
- e. CONSULTANT shall check the list of Spare Parts and other supplies to be made available by the Contractor to ensure compliance with the contract requirements and ensure their handing over to the OWNER. CONSULTANT shall also
- f. recommend Spare Parts inventory and future ordering schedule for trouble free operation of the PLANT.
- g. Suitable clause(s) shall be incorporated in the bids for handing over of the Spares/surplus materials including assistance for Creating the BPCL SAP Codes on a regular basis during the Project and handing over the Spares at least 3-6 months before the scheduled of Mechanical Completion.
- h. For Rotary Equipment, all the spares required for the future maintenance shall be coded in the existing CMT format and the procurement shall be done with the CMT code and shall be stored in the Warehouse.

11.0 PRE-COMMISSIONING & ASSISTANCE IN START-UP /COMMISSIONING

Provide assistance in pre-commissioning, start-up, Commissioning and Performance Test Run including all check lists, flushing schemes etc.

- 11.1** CONSULTANT shall provide Plant specific operating manuals for units, and other utilities for safe operations, start-up and shut down and emergency handling of the Process Units/facilities. The pre-commissioning scope to include:
- a. Prepare and provide 6 copies of plant specific operating manuals for safe operations, start-up and shut down and emergency handling.
 - b. The manual will also include the details of package items and their operating procedures and detailed operating guidelines.
 - c. The manual will be submitted for OWNER's review and approval at least 6 months before start of the pre-commissioning activities.
 - d. Consultant will prepare detailed flushing, pre-commissioning and commissioning schedule along with the scheme and procedures for unit & facilities and will submit for BPCL's review and approval sufficient time in advance.
- 11.2** Consultant will supervise/ carry out various works of initial operation for the preparation of unit facilities for commissioning, i.e. check-listing, flushing, pre-commissioning checks and assist in commissioning with OWNER's representatives.
- 11.3** Consultant's commissioning personnel shall be available at plant site for check listing, flushing, pre-commissioning and provide supervisory instructions during commissioning and initial plant operation till stabilization.

- 11.4** CONSULTANT'S representatives will assist OWNER/LICENSOR'S representatives if applicable in supervising various works of initial operation for the preparation of unit facilities for commissioning.
- 11.5** All modifications jobs required for pre-commissioning, part commissioning and for successful trial run of these units are to be engineered for execution by the CONSULTANT.
- 11.6** Statutory audits (Pre-commissioning Safety Audit) like OISD will inspect the plant for clearance for commissioning and any recommendations by such audits will need to be executed by CONSULTANT.
- 11.7** The pre-commissioning, commissioning, start-up activities include inspection, checking/ correcting and ensuring proper:
- a. Packing and Seals
 - b. Alignment of Rotating Equipment (Alignment reading in the laser alignment computer to be submitted)
 - c. Vibration readings of all rotary equipment (Base reading to be submitted in the
 - d. soft copy)
 - e. System Check/ Inspection
 - f. Flushing
 - g. Leaks & Pressure Tests
 - h. Safety Devices
 - i. Hydro-testing of Equipment/ Piping/ piping supports/ de-blinding
 - j. Commissioning of Electrical Power & Lighting Systems
 - k. Commissioning of Instrument Systems etc.
 - l. Commissioning of entire project
 - m. Immediate authentication of all necessary changes in interlock/ loop schematics.
 - n. Any other requirement pertaining to specific equipment in the plant.
- 11.8** The following activities also form part of Pre-commissioning & Assistance in start -up /commissioning: Participation & Ensuring all the commissioning/pre-commissioning activities of instrumentation job with established procedure as detailed below:
- a. Checking of bores of orifice plate in line with approved data sheet & installing them after flushing operation as per correct direction.
 - b. Ensuring all control valves installation as per flow direction after proper flushing of connected lines.
 - c. Stroke checking /operational checking of all control valves.
 - d. Checking instrumentation loops for proper functioning.
 - e. Functional check of all instruments /control loops etc. after proper line up of field instruments for commissioning.
 - f. Logic & other checking with Licensor/OWNER representative
 - g. Commissioning of instrumentation systems including special instruments, analysers, CCTV, nuclear instruments etc.

- h. Ensuring availability of spares for pre-commissioning/commissioning activities.
- i. Preparation of check list of all defects/problems & chalking out program for their correction & ensuring completion.

11.9 Preparation of as built drawing after commissioning & handing over to OWNER.

11.10 Handing over all vendor documents to OWNER which includes final vendor documents for all supplies and as built documentation from all contractors.

11.11 Advise BPCL to review and approve performance test procedures provided by contractors/licensors and specify, among other things, the following:

- a. Operating data to be recorded in a log sheet
- b. Sampling methods
- c. Analytical methods
- d. Methods of calculations
- e. Interpretation and measurement of tests
- f. Manner of taking operating data and its frequency
- g. Manner of evaluating performance of the unit, raw material consumption, utilities consumption and energy consumption, yields etc. including appropriate corrections if any for test conditions such as feed stock quality etc.
- h. Ensure that performance test of all units are performed in accordance with professional engineering standards, plant safety and operating standards.
- i. Evolve acceptable formats for handing over plants to BPCL including all required documentation, completion certificates etc. and recommend to BPCL regarding taking over of facilities.

11.12 PRE-COMMISSIONING

Consultant will prepare detailed flushing, pre-commissioning and commissioning schedule along with the scheme and procedures for unit & facilities and will submit for BPCL's review and approval sufficient time in advance

- a. Ensure that all the pre-commissioning/commissioning activities of the Project are carried out by contractor/other agencies in accordance with established procedure, schedules and program, as detailed below:
- b. Hot alignment checks and running of rotating equipment.
- c. Alignment of Rotating Equipment (Alignment reading in the laser alignment computer to be submitted)
- d. Vibration readings of all rotary equipment (Base reading to be submitted in the soft copy)
- e. Equipment operation checks e.g. vibration, trips, functioning of safety devices and other required operating tests and adjustments. CONSULTANT shall witness & certify the testing of all SRVs & TSVs.
- f. Flushing, blowing and chemical cleaning.
- g. Installation of temporary screens, strainers, and blinds.

- h. Adjustments and replacements, if necessary, of mechanical seals, packing and accessories as required.
- i. Necessary purge operations, including installation of temporary purge piping or hoses to equipment connections.
- j. Checking of bores of orifice plates and installing them after flushing operations.
- k. Pre-commissioning checks of all electrical equipment and energization of electrical equipment.
- l. Instrument calibrations with standard test equipment and all required adjustments and control point settings.
- m. Functional check on all instruments and controllers.
- n. Check all instrument loops for proper functioning.
- o. Checking and recording positions of all valves.
- p. Checks on pipe hangers, supports; and guides for hot/cold settings and necessary adjustments.
- q. Drying of refractories of furnaces, stacks and heat recovery sections.
- r. Ensure that all defects and deficiencies found during the course of Commissioning shall be rectified by the contractor.
- s. Preparation of operation and maintenance manual for open art units, utilities & offsites, BDT.
- t. Checking of operation and maintenance manual of licensed units prepared by Licensor/ contractor.
- u. Checking the availability of spares for pre-commissioning & commissioning.
- v. Collection of base data for future predictive and preventive maintenance.
- w. Assist BPCL in OISD pre-commissioning safety audit.
- x. Checking of all safety Interlocks as part of pre-commissioning

11.13 COMMISSIONING

The CONSULTANT will undertake the following jobs:

- a. Supervision/ monitoring of check-up and calibration of the various instruments to be used in plant system commissioning and testing.
- b. Supervision of all activities for commissioning and testing of various systems in accordance with the startup schedule.
- c. Preparation of a check list of all defects and chalking out program for their correction and completion.
- d. Development of criteria for Initial and Final Acceptance.
- e. Analysis and evaluation of the test results obtained during testing and commissioning in order to determine actual performance of equipment, units w.r.t. both Licensor's and Vendor's guarantees.
- f. Review and approve the performance test and advise OWNER the procedures provided by contractors/Licensors and specify, among other things, the following:

- g. Operating data to be recorded in a log sheet
- h. Sampling methods
- i. Analytical methods
- j. Methods of calculations
- k. Interpretation and measurement of tests
- l. Manner of taking operating data and its frequency
- m. The manner of evaluating the performance of the unit, raw material consumption, utilities consumption and energy consumption, yields etc. including appropriate corrections if any. LAB tests to ensure quality of products.
- n. Safe commissioning of unit/ monitoring of condition till stable operation.

11.14 PERFORMANCE TEST RUN

CONSULTANT to ensure that performance test of all units are conducted in accordance with the (conditions as laid down in the contract), professional engineering practices, plant safety and operating standards.

- a. To demonstrate the units, meet the CONSULTANT/LICENSOR guarantees, one or more performance test-runs shall be carried out under the technical direction of CONSULTANT/LICENSOR.
- b. The performance test-runs shall be carried out in accordance with the detailed program to be drawn by CONSULTANT in mutual consultation with OWNER and would be conducted under normal operating conditions.
- c. Within five days after successful completion of the test-run, all operating conditions, figures, actual achievements should be recorded. The format for the same will be developed by the CONSULTANT in discussion with the OWNER.
- d. On completion of performance test runs, prepare independent report for OWNER on performance of each unit with recommendations (in consultation with Licensors and OWNER) on ways and means of improving performance.
- e. CONSULTANT will evolve formats for handing over of plants to OWNER including all required documentation, completion certificates etc.

11.15 PROCESS GUARANTEES, RECTIFICATION AND DEFECT LIABILITY

- a. All works by vendors/Contractors with reference to the Project will be subject to a Defect Liability period during which the Vendors/Contractor(s)/other Contractors would be liable to correct, repair and/or rectify any and all defects and/or imperfections in the design of the work (in so far as the Contractor shall be concerned with the design of the work or any part thereof), in the work performed
- b. and/or in the materials components or other items incorporated therein. CONSULTANT shall, upon the written request of the OWNER, undertake such supervisory and/or consultancy services as may be required to monitor the Defect Liability obligations of Vendors/Contractor(s)/other Contractors and/or to ensure that Vendors/Contractor(s)/other Contractors perform in accordance with the requirements the corrective work, repairs and/or replacements necessary to rectify defects and/or imperfections.

- c. In addition, process licensors involved in the various processes incorporated in the Plant would have given guarantees covering various aspects of their respective processes. It is anticipated that the Plant may be tested, commissioned and operated by the OWNER even though some of the process guarantees have not been met, pending performance of fix-it or other rectification obligations by the concerned Process Licensor(s) and/or Vendors/ Contractor(s)/other Contractors. It shall be the responsibility of CONSULTANT to evaluate and review any corrective measures in design and engineering suggested on this behalf and to supervise and monitor implementation thereof or any re-test(s) as are necessary until the process guarantees have been met or discharged in accordance with the provisions of relative contract.

12.0 HEALTH, SAFETY AND ENVIRONMENT GUIDELINES

The Consultant shall establish, operate and maintain the HSE program for the term of the contract in accordance with BPCL's/statutory requirements. He shall be responsible for the implementation of HSE programs by contractors.

The Consultant shall ensure contractors comply with safety measures. The Consultant will appoint a sufficiently experienced person to be designated as Safety Officer and will ensure safety of work at site as per BPCL Safety Rules in consultation with BPCL Safety Department. The Consultant shall comply with all rules, regulations and orders of various statutory authorities, insurance, Engineer-In-Charge of BPCL etc. at no extra cost to BPCL. The Consultant shall assist in responding to factory inspectors/ministry in case of accidents/fires. The Consultant shall also depute adequate officers for safety coverage round the clock including Sundays and holidays. The Consultant shall maintain safety register for each contractor and report any accident/incident immediately to BPCL in BPCL's prescribed format. The Consultant shall ensure periodic tool box talk by all executing agencies and submit weekly report on HSE compliance by contractors working at site. The Consultant shall implement safety penalty criteria of BPCL as per "FINANCIAL DETERRENT FOR VIOLATION OF SAFETY NORMS BY CONTRACTORS". The Consultant shall have the authority to issue penalty letter to the offending contractor under intimation to BPCL.

The Consultant to certify all the scaffoldings, hot-work jobs, rigging, 230/440 V supply, confined space entry and all critical activities. The Consultant shall follow shift-wise work permit system in line with BPCL's Work permit system. The work permit for every job shall be signed by the Consultant's site engineer.

The Consultant has to suggest & implement philosophy for housekeeping & scrape/debris removal.

13.0 PROJECT QUALITY GUIDELINES

- a. The Consultant along with contractors/sub-contractors working on this contract shall ensure compliance with latest revisions of ISO 9001, ISO-14001, ISO 10013 and ISO 45001.
- b. The Consultant along with associated contractors/sub-contractors are required to submit Quality Plan (QP) for BPCL's review/approval. The QP at minimum should describe all activities, their control points and controlling document/procedure. The QP shall be as per the Consultant's standard format.
- c. The Consultant along with associated contractors/sub-contractors shall be subject to audit.

14.0 COMPUTER SOFTWARE REQUIREMENT

Entire plant shall be designed on a computer based reputed "Plant Design Management Systems" On Windows platform to furnish the following:

- a. Plot plan
- b. General Arrangement Drawings (GAD's)
- c. Isometrics
- d. Bill of materials
- e. 3D model of the plant

- 14.2** For development of PDS model, Company will provide PDS library to have synergy with existing and refinery expansion project under implementation and development of PDS data base library is not required.
- 14.3** PERT Network and other project planning documents shall be done on Primavera and/or MS Project Planner.
- 14.4** All text data shall be on MS Word in Windows Office 10 and above.
- 14.5** All Spread sheet work shall be on MS Excel in Windows Office 10 and above.
- 14.6** All other documents like presentations etc. and other data shall be in MS Office in Windows Office 10 and above.
- 14.7** All drawings shall be furnished in PDMS format.
- 14.8** All the above drawings and documents shall be delivered in 6 copies on Hard disk's along with hard copies.
- 14.9** All documents shall be furnished on separate compact discs, and the contents shall be in MS office compatible packages.
- 14.10** For Instrumentation items, all vendor documents shall be handed over to OWNER in Smart Plant Instrumentation (SPI) format, for OWNER to upload the same in their LAN/WAN.

ANNEXURE-II(B)**CONSULTANT'S SCOPE OF WORK FOR PACKAGE MODE OF EXECUTION****1.0 SCOPE OF WORK**

CONSULTANT shall perform services for the PROJECT, Units & Facilities under the scope of which is as explained in this document but not limited to: Unless otherwise specifically agreed, as such CONSULTANT shall perform and be responsible for the performance of all services as necessary for or incidental to providing comprehensive project management and associated services for the Project commencing from the preparation of Tender Documents, evaluation of bids, awarding and management of package contract(s), reviewing, planning and supervising detailed engineering, procurement, construction, testing and commissioning. Details mentioned in the Annexure-I are also applicable for engineering construction management, pre-commissioning, commissioning, start-up, performance test run guarantee.

- a. Note: The details of packages given in Chapter 1 are indicative only. Consultant taking OWNER into loop shall come up with the Packages based on their experience and quantum of job. CONSULTANT to note that the decision to go for packages shall be for benefit of the Project implementation without having any impact on project schedule & cost. CONSULTANT shall perform the Work promptly in an efficient, orderly and workmanlike manner and shall deploy necessary qualified and skilled persons according to the requirement of the Work, enforce discipline and order among its employee and observe the safety and security instructions of OWNER while operating at the site. If necessary, the CONSULTANT shall work overtime or in two or more shifts in a day and or Sunday and/or holiday.
- b. CONSULTANT shall represent, warrant and agree that in the execution and performance of this Project, it will comply with any and all applicable laws.
- c. CONSULTANT shall within 4 months after commissioning submit to OWNER final bill of the Contractor. CONSULTANT shall make recommendations to enable OWNER to settle all the outstanding matters/disputes with the third parties regarding pending bills, claims, cases of delayed delivery/delayed completion etc. of vendors and contractors within four months from commissioning of the Project. However, with respect to the unsettled matters by this period, CONSULTANT shall hand over all documents along with suggested action plan pertaining to such outstanding matters to the satisfaction of the OWNER to enable OWNER to directly process thereafter.
- d. CONSULTANT must take prior approval of the OWNER regarding the vendors and contractors list for supply/ undertaking various jobs pertaining to the Project and follow OWNERS agreed & approved tendering & procurement procedure
- e. Consultant shall provide all assistance in obtaining Statutory approvals along with package Contractors. CONSULTANT shall include following provisions in PACKAGE Tenders w.r.t. Statutory approvals:
 - i. Package Contractors shall obtain Statutory approvals from IBR, CEA, Lift inspector, Maharashtra Electricity Duty Inspectors, Industrial Licensor etc. and submit the original documents to OWNER.
 - ii. For PESO & OISD approval, package Contractors shall provide all services including drawings required to obtain the approvals. Any Liaisoning required with

the concerned Authorities shall be in the scope of Contractors without any extra payment.

- f. CONSULTANT shall be responsible for measurement, checking and certification of Supplies and Works performed by Vendors, Contractors and/or Contractor's Vendors.
- g. CONSULTANT shall provide key commissioning personnel for the Assistance in commissioning of the Plant.
- h. CONSULTANT shall develop and install a suitable communication system for transfer of various documents/drawings electronically / through E-mail / Internet among CONSULTANT, Contractor and OWNER.
- i. CONSULTANT shall list out the requirements of consumables & chemicals along with their quantity and detailed specifications required for pre-commissioning, trial runs and six months continuous running. The same is required to be given to OWNER six months in advance for procurement.

Some of the salient features of the scope of work for each facet of the Project activities are described hereinafter. These details are not limiting, and the CONSULTANT will be responsible for all other activities required to achieve completion of the Project, notwithstanding that the same are not specifically set out below.

1.1 PROJECT MANAGEMENT

CONSULTANT, during various phases of the Project, shall be responsible for total management of Project activities covering (but not limited to):

- a. Preparation/compiling of Tender Documents for getting Package bids for Engineering, Procurement and Construction and Commissioning.
- b. Evaluation of bids and preparation of recommendations to OWNER for award of PACKAGE /Package contract(s).
- c. Management of selected package contractor(s) and other contractors to ensure timely/economic and quality completion of Project.
- d. Ensure that P&ID's are updated based on vendor information. Ensure checking and finalizing hydraulics and verify suction and discharge line size/head of pumps/compressors based on final plan layout.
- e. Pre-commissioning
- f. Commissioning and performance testing of the entire Project facilities

1.2 PLANNING & CONTROL

- a. Preparation of major milestones for the entire project including that of PACKAGE works.
- b. Developing an appropriate MIS covering monitoring, reporting, controlling, feedback, mid-term corrections. Assist OWNER in preparation of reports for ministries.
- c. Organize & participate in regular project review meetings monthly at Mumbai/New Delhi and daily/weekly at site or as required and submit monthly progress reports and daily / weekly / fortnightly flash reports on Engineering/Site Services.
- d. Ensuring submission of as built drawings and P&IDs by PACKAGE Contractors.

- e. The CONSULTANT and the contractors (PACKAGE) shall use common computer software for ease of information exchange/ data integration.
- f. The list of deliverables for planning & monitoring of the project is included in Chapter-2 Consultant Scope of work.

1.3 DEVELOPMENT OF PROJECT PROCEDURE

Preparation of procedures covering mechanical completion, pre commissioning, commissioning, start-up, performance test runs for the Units and their takeover from the PACKAGE Contractors.

1.4 PROJECT QUALITY ASSURANCE

1.4.1. CONSULTANT shall perform the following Quality Assurance & Quality Control activities:

- a. Prepare & enclose the following as part of PACKAGE bid documents after taking due approval from the OWNER:
 - i. Overall generic Quality Assurance and Quality Control (QA/QC) System for the various phases of the Project (i.e. Engineering, Procurement, Construction and Commissioning).
 - ii. Overall QA/QC plan for the project
 - iii. QA/QC procedures for common equipment & bulk materials

- b. Review/approval (in consultation with the OWNER) of Quality Assurance Program of each PACKAGE Contractor in respect of all materials to be supplied and works to be performed by the respective PACKAGE Contractors.

CONSULTANT shall ensure that the Quality Assurance Program of PACKAGE Contractors is based on the documents enclosed by CONSULTANT in the PACKAGE bid documents.

- c. Keeping regular surveillance and audit Quality Assurance Program of PACKAGE contractors, other contractors and vendors and ensure its implementation.
- d. Preparing and updating QA/QC report for the entire project on a regular basis identifying areas for corrective action by concerned agencies
- e. Preparing detailed scope and stages of inspection for all procurement items viz. equipment and bulk materials.
- f. Ensure that the PACKAGE Bid contains a clause that the PACKAGE contractor will forward to BPCL for their review the plan describing the responsibility for various activities and technical interfaces and necessary resources required for effective planning.
- g. Ensure that the PACKAGE contractor shall adhere to design control exactly as per ISO 9001. He should submit required records as evidence for review of BPCL as and when required and shall carry out changes based on BPCL review.

1.4.2. In order to achieve superior QA during all stages of construction, CONSULTANT besides carrying out strict monitoring as per drawn up QA plan, should undertake measures to identify & liquidate problem w.r.t mix up of various material such as piping, flanges, joints etc., with particular emphasis to High pressure & High temperature section for the entire project. Use of modern gadgets like positive material identification (PMI), Torque wrenches etc. have to be ensured for this purpose.

1.5 MONITORING, COORDINATION & SUPERVISION OF PACKAGE CONTRACTORS

CONSULTANT, as Engineer-in-Charge of PACKAGE / PACKAGE Contractors shall perform the following activities:

- a. Establishing of project control system to control, monitor and report to the OWNER by PACKAGE Contractors.
- b. Providing an effective, continuous liaison and control both at site and design office of the PACKAGE contractors to ensure prevention of slippage in project schedule.
- c. Monitoring of PACKAGE contractors' various activities with particular focus on procurement, expediting & inspection and suggesting corrective actions thereof.
- d. Study, analyse, review, check, certify and recommend to OWNER any change orders, claims, additions/deletions in the PACKAGE contractors during the project execution.
- e. Studying of systems, adequacy check of existing equipment and recommendation to the OWNER for necessary augmentations/changes, if any.
- f. Supervision and co-ordination of all PACKAGE contractors' activities viz. planning, organizing, controlling & monitoring.
- g. Define clear and unambiguous boundary limit conditions for each of the PACKAGE Contractors.
- h. Co-ordinate and liaison with all PACKAGE Contractors to ensure no overlaps or left out activities in the total project work.
- i. Ensure all drawings prepared by successful PACKAGE bidder will conform to statutory regulations and standards.
- j. Ensure all hook-up connections are covered in the PACKAGE for piping, electrical, civil, mechanical, instrumentation, DCS etc. to integrate the entire project activity & sort out discrepancies between various agencies/ contractors/ licensors.
- k. Preparation of Routing drawings for piping, electrical and instrument cable routing along the corridors. While preparing underground cable routing, ensure that no high temperature process pipelines, steam condensate lines, steam traps are crossing or near the vicinity of cable trench or cable routes.
- l. Checking, certifying and recommending the billing break-up/ billing schedule furnished by PACKAGE Contractors.
- m. Close follow up/ expediting of delivery of critical equipment/ Long Lead items.
- n. Certification of Wage/attendance of labour, witnessing of Labour payments, certification of PF/ ESI challans etc.
- o. Certifying the PACKAGE Contractors' documents, invoices, bills of the supplies and/or works as the case may be to enable the OWNER to release the payment to the PACKAGE Contractors as per respective billing schedule.
- p. Ensuring submission and review of site work procedures of Package contractors, especially critical equipment erection, height work, work in confined spaces, testing of HT cable and panels etc. for ensuring safe execution at site.
- q. Ensuring handing over of all mandatory spares (along with all relevant documents and itemized cost) at BPCL-MR stores by contractors in a sequential manner with SAP

Codes. This activity should start at least 6 months before mechanical completion and complete within 2 months of Mechanical Completion. For generation of SAP Material codes, the required date duly filled in formats to be given by PACKAGE Contractors as soon as they firmed up the orders on vendors. Consultant should ensure this activity for timely closing the job.

- r. Ensuring proper handover of surplus material by PACKAGE contractors to OWNER along with BPCL Material code numbers and approximate cost.
- s. Ensuring handover of special tool and tackles by Package contractors by identifying the requirements.

1.6 DRAWING/ DOCUMENT APPROVAL

CONSULTANT shall:

- a. Finalize plot plan along with PACKAGE contractor based on equipment sizes, site restrictions, maintenance & shutdown considerations, safety, construction access and statutory requirements like Oil Industry Safety Directorate (OISD) etc.
- b. Specify the Lists of critical drawings for the project including categorization of drawings as "Drawings requiring Approval" and "Drawings for Reference". Further Electronic mail transfer facility / other state-of-the art communication facilities should be adopted for approval of drawings and documents for expediting the entire process. CONSULTANT shall approve all critical drawings / documents upon submission by PACKAGE contractor across the table. To hasten up the process, approvals across the table at designated design centers have to be set up.
- c. If the approval of drawings or documents or other proposal(s) is not granted by the CONSULTANT within 10(ten) working days from the date of submission by the PACKAGE Contractor, such drawings or documents or other proposal(s) will be deemed to have been approved by the CONSULTANT. Full responsibility of quality and/or correctness of the job carried out using such drawings or documents or other proposal(s) shall rest with the CONSULTANT.
- d. For drawings/ documents the updated consolidated status indicating their submission, review & approval etc. should be made available by CONSULTANT to OWNER through electronic mail. All drawings shall be properly signed & stamped with type of approval for identification.
- e. Review/ Approval of MR (Material Requisition) prepared by Package contractors in respect of all material to be supplied by Package contractors:
 - i. Critical Category – 100%
 - ii. Semi Critical Category – 25%
 - iii. Non-Critical Category – 10%
 - iv. Other Category - Nil

*These Categories of items shall be identified by consultant in consultation with OWNER.

Generation of monthly MIS on status of approval of drawings.

1.7 Project Cost Control

CONSULTANT shall undertake:

- a. Cost budgeting, expenditure profile and forecasting for the entire project.
- b. Preparation of detailed cost estimate for each procurement/ contract in consultation with the OWNER and as per approved Tendering/ Purchase Procedure of OWNER.
- c. Preparation of report highlighting planned expenditure profile vis-a-vis actual expenditure on an annual basis for budgetary control purposes of the OWNER.
- d. Preparation of cost status reports including cash flow analysis on monthly basis.

2.0 PROJECT EXECUTION

The scope of CONSULTANT's services for the PACKAGES is as follows:

- a. Preparation of Tender Documents for PACKAGE Contracts, tendering, evaluation and recommendation for award of Contracts.
- b. Management of PACKAGE Contractor(s) during following phases:
 - i. Detailed Engineering
 - ii. Procurement
 - iii. Construction
 - iv. Pre-commissioning
 - v. Commissioning
 - vi. Performance guarantee test run (PGTR)

The detailed scope of CONSULTANT'S work for each of these phases is covered in the following paragraphs, which will not be limiting, &CONSULTANT is required to ensure completion of the entire scope of the Packages defined.

3.0 SERVICES PRIOR TO THE AWARD OF PACKAGE

- 3.1 Review of site(s) meteorological data, earthquake/seismic survey reports, preliminary soil report and other data such as EIA/Risk Analysts reports, Environmental Clearance Conditions etc. as available. CONSULTANT will identify any additional data as required and initiate actions to obtain the same from available sources. If any such data is not available, the same are to be generated by appointing contractor(s) to undertake necessary studies as approved by the OWNER. The CONSULTANT will undertake all services necessary for and in relation to such appointments, including the preparation of tender documents, recommendation of contractor and supervision of the contractor(s) work.
- 3.2 The Plot plan and equipment layouts will be reviewed, updated and detailed by CONSULTANT, as necessary.
- 3.3 Preparation of Tender Documents, invitation of bids, evaluation of bids and award of contract for traffic study of rail/road/water ways, for transportation (including ODC) during construction phase to identify constraints in movement and suggestions for improvement of existing offsite infrastructure facilities like Roads, Bridges etc. and also provision of new facilities. Co-ordination and supervision of this traffic study and compilation/overview of the report will also be done by CONSULTANT.
- 3.4 CONSULTANT shall carry out identification, analysis, basic design, preparation of specifications /cost estimates, Vendor list etc. in respect of various technical support facilities such as communication, computer software, communication link among various offices of CONSULTANT/PACKAGE Contractors/OWNER through wide area network, testing facilities etc. OWNER, on the advice of CONSULTANT, you may decide whether to include all or any of such

facilities in the scope of PACKAGE Contractors or appoint a separate contractor for the same. All services related to award of work, construction supervision and construction management in respect of these facilities shall be provided by CONSULTANT at no extra cost.

3.5 CONSULTANT will develop the following, in close coordination with OWNER, by adopting an appropriate pre-qualification procedure for each category.

- a. Short listing of PACKAGE contractors
- b. Preparation of Vendor list (Indian/International) for equipment and materials
- c. Documents/Drawings Distribution System identifying review/ approval/information types.

3.6 Provide an estimate of construction water and construction power requirement at MR including broad specifications of the same.

3.7 Carryout basic engineering, design and execution of complete construction water and construction power distribution schemes (from the point source at site identified by BPCL within Refinery).

4.0 PACKAGE CONTRACTOR'S MANAGEMENT DURING VARIOUS PHASES

CONSULTANT shall undertake the following jobs towards management of PACKAGE Contractors during various phases of the project:

- a. Pre-Qualification of PACKAGE bidders
- b. PACKAGE Bid Preparation
- c. Evaluate options (a) whether tender shall be floated on three bids systems i.e. prequalification, technical (Unpriced) bid and commercial bids in separate envelop together OR (b) prequalification details shall be obtained first and float the tender to the qualified bidder in two bid system i.e. technical bid and commercial. After evaluating the options, consultant shall furnish recommendations for methodology to be adopted.
- d. Tendering and Award of PACKAGE contracts
- e. Management of PACKAGE contracts after award

4.2 PRE-QUALIFICATION OF PACKAGE BIDDERS

- a. Preparation of pre-qualification criteria in consultation with OWNER for the selection of PACKAGE bidders
- b. Prepare pre-qualification bid document 'for pre-qualification of Bidders for PACKAGE bid(s) in consultation with OWNER.
- c. Invite pre-qualification bids.
- d. Analysis & evaluation of the pre-qualification bids.
- e. Recommend to OWNER the list of pre-qualified bidders.
- f. Alternatively, float the tender in three bid system as per para 4(iii) above.

4.3 PACKAGE BID PREPARATION

4.3.1. Prepare tender documents for engineering, procurement, construction of the Project for package execution. Tender documents shall be reviewed/approved by OWNER for which adequate time should be given. The evaluation criteria will be developed by CONSULTANT in consultation with the OWNER.

- 4.3.2.** The CONSULTANT should prepare PACKAGE tender documents as above to enable PACKAGE Contractor to prepare detailed engineering in conformity with international standards and sound engineering practices. The PACKAGE tender documents will have to be comprehensive, sufficiently detailed, self-contained, to enable getting competitive lump sum bids, without scope for subsequent corrigenda/ addenda/ modifications during bidding stage. Any delay on account of extension of time granted in submission of bids by PACKAGE bidders on account of corrigenda/ addenda/ modifications issued by the Consultant shall be attributed to the CONSULTANT if it is established beyond doubt that Consultant is solely responsible for issue Corrigenda/Addenda/Modification for its own act of omission/mistake/lapse. The Bid should ensure adoption of uniform specifications and standards to ensure good quality for the entire project.
- 4.3.3.** OWNER will invite the bids from prospective pre-qualified Indian/International bidder or alternatively adopt three bid system as per evaluation. CONSULTANT will conduct pre- bid conference with OWNER'S participation, specify criteria for evaluation, perform bid evaluation in all aspects such as technical, financial, contractual, legal matters, submit a bid evaluation report with recommendation for the best bidders (based upon a predetermined evaluation system approved by OWNER), participate and assist OWNER in negotiations, prepare and print the final contract documents.
- 4.3.4.** Specific commercial Conditions to be included in the tender documents to be obtained from the OWNER. An index of contents of the proposed tender documents for PACKAGE Contracts should be enclosed by prospective CONSULTANT with their offer. The document should broadly include the following but not limited to get substantially responsive offers from PACKAGE bidders:
- a. Commercial Conditions
 - b. Process Package & FEED Segregation.
 - c. Technical Requirements covering but not limited to Civil, Structural, Architectural, Pressure Vessels, Piping, Mechanical Equipment, Rotating Equipment, Electrical, Instrumentation, Heat & Mass Transfer (HMTD) Details, SMMS & Environment
 - d. Engineering Drawing & Data sheets for various equipment and works.
 - e. Standard specifications for various equipment, works and materials.
 - f. Engineering codes standards & sketches for various equipment for fabrication, erection, procurement etc.
 - g. Other miscellaneous items
 - h. Inspection and test plan, inspection, monitoring and expediting methodology including stage wise inspection procedures for mechanical, electrical, civil, instrumentation equipment, consignment movement and other jobs of PACKAGE contracts.
 - i. Project execution plan
 - j. Statutory clearances and statutory requirements etc.
 - k. Construction management philosophy including pre-commissioning, commissioning, start-up, test run, and performance guarantee runs.
 - l. Any other Conditions, Specifications as deemed necessary to make comprehensive PACKAGE bid document.

- 4.3.5.** CONSULTANT shall include a clause in PACKAGE bid that the PACKAGE contractor shall adhere to design control exactly as per ISO 9001 or latest. He should submit required records as evidence for review of BPCL as and when required and shall carry out changes based on BPCL review.

4.4 AWARD OF PACKAGE CONTRACTS

- 4.4.1.** CONSULTANT shall undertake the following jobs during the process of award of PACKAGE work(s)

- a. Organize pre-bid meetings with the pre-qualified bidders.
- b. Participate in techno-commercial discussion and furnish clarifications to the bidders along with OWNER.
- c. Prepare technical commercial addenda points including issuance to the Bidders for compliance.
- d. Evaluate techno-commercial bids, price bids
- e. Furnish final recommendations to OWNER regarding Award of work including the detailed cost estimate along with supporting documents as per BPCL Tendering Procedure.
- f. Prepare Contract Documents.

- 4.4.2.** CONSULTANT shall perform the following jobs in the event of off-loading of PACKAGE contractor:

- a. Perform all the services arising out of any off-loading of PACKAGE/ other contractor(s) viz. issue of termination/ other notices to PACKAGE, re-tendering for lining up fresh agency etc. WITH NO EXTRA COST to OWNER.
- b. Perform all the jobs related to any change orders/ addenda/ deviations including its analysis, recommendation with proper justification and obtain approval from the OWNER before issue.

5.0 SERVICES FOR PACKAGE EXECUTION

5.1 SERVICES FOR DETAILED ENGINEERING

5.2 PREPARATION OF ENGINEERING DESIGN BASIS

The Engineering Design Basis shall be developed for detailed engineering of the plants & facilities for the project.

5.3 REVIEW OF DESIGN DOCUMENTS AND DRAWINGS

Review all important design documents and drawings of PACKAGE and other contractors to ensure consistency and adherence to contractual engineering specifications and adherence to QA/QC plans. Such documents, for example, are:

- a. P & ID'S
- b. Rotating Equipment

Specifications and data sheets of critical equipment such as Reactor, Regenerator, compressors, turbines, identified critical pumps, etc.

- c. Pressure Vessels

Engineering data sheets and specifications for Reactors and Columns, Typical Vessels and Drums and Typical Tanks, including internals. Fabrication Specification of equipment with special metallurgy.

d. Mechanical Equipment

- i. Specifications and data sheets of heavy cranes (including EOT/HOT), flare system, special purpose machines
- ii. Pneumatic handling system
- iii. Heating, Ventilation and Air conditioning (HVAC) System
- iv. System of Pressurized ventilation and air conditioning of various buildings (Plant/non-plant) as required.

e. Piping

- i. Equipment layouts
- ii. Isometric drawings of critical lines
- iii. Flexibility analysis and supporting system of pipelines
- iv. Confirmatory check for Isometric Drawings versus Piping & Instrumentation Diagrams to be done.

f. 3D Modeling

Consultant to prepare Preliminary 3D model for the Packages and further PACKAGE contractor shall prepare the detailed model of all the facilities (including all OWNERS facilities) in an integrated & intelligent 3D software solution using rule-based, data centric 3D Design software with equipment drawings, data sheets, intelligent P&ID correlated with intelligent 3D Model, BOQ, schematics and logic diagrams etc. attached to the respective equipment / systems in the aforesaid 3D model. Package contractor shall make a presentation on 3D model every 3 months from LOA to enable BPCL / CONSULTANT to review the progress of engineering. After the completion of engineering of respective areas, the corresponding complete 3D review model shall be handed over to the employer for its reference. Consultant shall provide 3D design review model (network ready, which shall include visual interference check, walk-through animation, video simulation for major equipment placement and removal, visual effect, photo realism etc.), which is extracted from intelligent 3D model, for employer's review as & when desired by employer. The computer software for modeling to be used for piping shall be PDMS or equivalent for the entire work of layout & Design of Piping System, Structural layouts etc. Module for plant shall be done by the PACKAGE Contractor. After completion of design/ details of the PLANT, the same shall be presented to the CONSULTANT/OWNER for review. CONSULTANT/OWNER'S comments shall be incorporated. All the Data/Documents/ Electronic files, etc., shall be handed over to the OWNER of the finalized Model along with the necessary software. The review of 3-D modeling of the unit covering multi disciplines such as Civil & Structural, Mechanical, Electrical& Instrumentation shall be done at the following Stages:

- i. 30% model: will cover all piping (4" and above), control valves, block valves NRV etc. and should also include underground piping, major foundations etc. The 3D modelling shall also cover all the Electrical equipment's of ISBL.

- ii. 60% model: will cover all piping < 4" dia including equipment (except package) and those missed out in 30% model review. The 3D modelling shall also cover all the Electrical equipment's of ISBL and Electrical equipment's located in sub-station.
- iii. 90% model: Review will include complete field instrumentation system including final control element/ cable duct/tray / junction box /instrument locations - tappings -Hook ups / Analyzer Shelter Location Etc. CONSULTANT shall ensure that 3D model shall be developed & demonstrated with dynamic walk-through facility to check any interference, requirement of operation/ maintenance of instruments/equipment. CONSULTANT also to ensure that facilities of viewing/modifying the 3D model to be available at site. The 3D modelling shall also cover all the Electrical equipment's of ISBL (Including Lighting illumination levels in designated areas), and Electrical equipment's located in substation.
- iv. 100% Model: Plant completely modeled with all disciplines from conventional and Package shall be responsibility of the Consultant.
- v. The Consultant shall integrate all the package 3D models with the main 3D model and ensure that the final 100% model is complete in all respects, incorporating all comments, resolving all clashes, and including site modifications carried out. In short, it shall represent the as-built 3D model.

g. Electrical Engineering

- i. All the electrical equipment has to be energy efficient and standardization to be kept in mind while selecting.
- ii. Single line diagram/Schematics
- iii. Area classification drawings (If any facility is installed adjacent to an existing REFINERY facility, area classification of existing facility also to be reviewed and recommendations to be given if necessary for any changes in equipment.)
- iv. System design including fault analysis
- v. Design/ capacity calculation of all electrical equipment.
- vi. Control & Logic diagrams and interlocks
- vii. Interconnecting drawings
- viii. Specifications of all electrical equipment's
- ix. Equipment layout drawings
- x. Terminal & Wiring Diagrams
- xi. Cable. specifications, cable routing including trenching/overhead cable trays, cable numbering
- xii. Lighting/Earthing Layout
- xiii. UPS & VFD specifications
- xiv. Fire alarm layout drawings and its cable schedule for plant and all buildings.
- xv. HVAC system and lighting for Sub-station, SRR and control room.
- xvi. Emergency Power network for project including DG set and hook up with existing electrical system.

- xvii. O&M Manuals and Instruction Manuals of electrical equipment's as well as complete substation and system.
 - xviii. Irrespective of vendor prepares SLD or not, Consultant shall prepare SLDs of all switchboards at all voltage levels and shall be submitted to OWNER in editable AutoCAD format so that future modifications done by OWNER can be incorporated.
 - xix. Complete relay settings and coordination charts of all electrical equipment's (from the highest voltage to the lowest feeder level) shall be prepared by consultant and submitted to OWNER as single comprehensive document consisting of relay settings and coordination charts of substations and all feeders. Coordination has to be checked with upstream electrical system.
 - xx. Preparation of cable drums schedules of all the cables.
 - xxi. Preparation of cable tray schedule for above
 - xxii. Preparation of schedule for Bulk Electrical Material Take-off (MTO)
 - xxiii. Preparation of Drawing control index, ITPs etc. for Electrical equipment in conjunction with vendors.
 - xxiv. Submission of final as-built drawings of all electrical related facilities like sub-station equipment (HV/LV switchboards, transformers, charger, UPS, VFD's, heater, soft starter, battery etc.), equipment layout, overall/ detailed cable layout, earthing layout, lighting layout, lighting fitting/ panel schedule, PA and FA layout, interconnection schedules/ drawings, motors etc.
 - xxv. Submission of factory test reports as well as site test reports of all the electrical equipment's, commissioning reports of electrical system, lux level report, earthing value report etc. for electrical related facilities of the project.
- h. Civil and Structural Engineering and Architectural works
- i. Boundary wall and Fencing
 - ii. Underground piping i.e. Oily sewers, storm water sewers and sanitary sewers etc.
 - iii. Roads & Pavements
 - iv. Foundations of all structures, especially critical equipment such as heavy-duty rotary machines and turbines, compressors, tall and heavy towers, stacks, multi-story framed structures, tankages etc.
 - v. Fire Protection work for equipment/piping
 - vi. Plant as well as non-plant buildings
 - vii. Water Supply (drinking/Plant/cooling water etc.)
 - viii. Architectural plans and elevations of plant buildings
- i. Heat and Mass Transfer Equipment
- Review of PACKAGE contractor's design and Engineering of furnaces and boilers and heaters, heat exchangers (including air coolers), waste heat boilers, ejectors, air pre-heaters, etc.

j. Instrumentation

- i. Distributed Digital Control System (DCS) specification including computer control
- ii. Programmable Logic Controller (PLC) and Hard wired shut down system
- iii. Specifications for critical items such as chromatography, analyzer, etc.
- iv. Typical and critical control valves, safety valves
- v. Interlocks and logic diagrams
- vi. Cabling and Tubing layout including Trenching and overhead trays
- vii. Review /approval of Cable duct/tray layout drawing
- viii. Review /approval cable trench drawing near control room building / plant area
- ix. Review/approval Control room layout/Civil/ Architectural drawing
- x. Review /approval Inst hook up/air layout/gas detection layout / JB and instrument location layout / Analyzer room location and construction drawing
- xi. Participation in all the technical review meetings / kick off meetings/system design review meetings etc. of all critical Instrumentation items like DCS/PLC/Analyzers/control-on-off valves/transmitters etc.
- xii. Participation in FAT of critical instrumentation item DCS/PLC, Analysers etc.
- xiii. Review /approval of PR & MR of different instruments.
- xiv. Participation in Model review of complete field instrumentation system including cable duct/tray/junction box /instrument locations -tappings - Hook ups /Analyzer Shelter Location Etc. to be considered.
- xv. Review/approval of all package instruments drawings/ documents & their interface to DCS/PLC
- xvi. Quality of final documentation shall be verified by EPCM. All final documentation shall be submitted in bounded condition only and shall contain all design calculations, purchasing documents, datasheets, operating and maintenance/troubleshooting manuals, etc.

k. PACKAGE UNITS

Review of PACKAGE Contractor's design specifications for packaged units from the point of view of suitability and conformity to the project specifications, ease of operation and maintenance and quality control of the sub- components. For overall control, a stage-wise approval from the CONSULTANT should be specified for all such package units i.e. at stages of detailed design and manufacture.

l. COLUMNS & INTERNALS

Review of Licensors and PACKAGE contractor's design and engineering of all critical columns and their internals, including past performance of the proposed design of the internals.

m. Energy Conservation

Consultant is required to take all necessary action in upgrading the system to the highest / optimum efficiency level by taking the following measure. The Consultant's Project

Completion Report should clearly bring in the measures taken and present to the OWNER as PROJECT HIGHLIGHT taken for Energy Conservation.

- i. Use of LED Lamps in the complete plant area, Substation, SRR and control Rooms.
- ii. Use of Roof top Solar PV Panels in all plant buildings / Battery Charging / Night & Emergency lighting system.
- iii. Highly efficient & long-life material for insulation
- iv. Maximization of Condensate recovery.
- v. Ground water charging all around / Rain water harvesting systems.
- vi. Any other measure as prevalent elsewhere OR by innovation.
- vii. Heat recovery facilities in process units e.g. PRT.
- viii. VAM for control room air conditioning etc. Wherever residual process heat stream is available.

ix. High Efficiency motors for rotary equipment.

n. The Consultant shall

- i. Develop specifications for dedicated and editable documentation node.
- ii. Interface new control facilities with data networks of BPCL's ERP and MES for duplex communication.
- iii. Define Digital Control System (DCS) including redundancy concept in control/data acquisition, operator interface, advanced control / optimization interface with DCS, different layers of control / MIS/ optimization / LAN / WAN, etc.
- iv. Define Process Optimization philosophy and its integration to DCS including type of computer required for advanced process control (APC).
- v. SIL requirement for PLC and safety instruments to be firmed up and implemented (based on HAZOP studies and/or preliminary SIL assessment report of Licensor). SIL for loops / systems shall be ascertained before recommending SIL for the instruments in loop/systems. Scope shall include-
 - Developing project specific methodology to incorporate IEC 61508/61511 in requirements for selected loops
 - Developing SIL requirements based on risk assessments
 - Developing safety requirement specifications (SRS documents)
 - Inclusion of SRS in MR specifications of DCS/Logic solver and Field instrumentation including final control elements.
 - Carryout functional safety assessment, verification & implementation of the same.
 - Proof test period shall be selected on practical & doable basis while carrying out SIL calculation.

o. Partial Stroke Test (PST) function shall be considered for critical/identified Shutdown valves.

- p. Define guidelines for safety instrumentation and instrumentation/automation for product transfer.
- q. Define & provide CCTV system for monitoring flare and other critical areas in new units.
- r. Define online as well as offline analyzer requirements along with sampling systems.
- s. Integrated Alarm information Management system
- t. Instrument Asset Management system for Smart instrument including instrument advanced diagnostic and valve signature software's.
- u. Developing hazardous area classification of plant areas for selection of suitable instruments.
- v. Define and provide Control room / Rack room environment monitoring systems like temperature, humidity and corrosion transmitters.
- w. Advance diagnostic system for predictive maintenance for instruments and control systems

5.4 CORROSION PROTECTION & INSPECTION REQUIREMENTS

CONSULTANT will be required to specify suitable measures for corrosion protection of material and equipment for all the services involving corrosive media and to ensure that suitable provisions are made for installation of "inspection facilities" in most vulnerable locations to assist in periodic inspection and condition monitoring.

5.5 SAFETY AND ENVIRONMENTAL ENGINEERING

CONSULTANT will consider and incorporate major features necessary to ensure the safety of the plant and personnel. CONSULTANT will take into consideration local and international standards pertinent to pollution and environmental control, including effluents and solid waste, atmospheric emissions, luminosity, noise control etc. and the stipulations indicated in the Environmental Clearances from State Pollution Control Board as well as Ministry of Environment and Forests, Government of India for all units and processes emitting any gaseous, liquid or solid waste or effluent including (but not limited to) the following:

- a. Liquid, gaseous and solid waste treatment and disposal facilities, including discharge route/point for effluents
- b. Influent and Effluent quality monitoring stations
- c. Air pollution control measures and monitoring system
- d. Noise pollution control measures and monitoring system
- e. Preparation of offsite and onsite Disaster Management Plans
- f. Catalyst loading and off-loading system.

5.6 MONITORING OF PACKAGE CONTRACTOR'S ENGINEERING AND DESIGN ACTIVITIES

During the PACKAGE Contractor's engineering and design activities, CONSULTANT will provide a staff of professionals, as required, at the PACKAGE Contractor's office (in India) to monitor the progress and ensure adherence to the Contract and Project schedule. In addition to this staff, CONSULTANT will schedule visits by lead engineers / engineers on need basis, from the Home office to the PACKAGE Contractor's Office (in India), to review specific engineering and design deliverables, to provide clarifications and to help in removing bottlenecks, if any. Regular reports of

such visits and of supervision undertaken by CONSULTANT at PACKAGE Contractor's office (in India) will be furnished to the OWNER for information/recommended action, as necessary.

CONSULTANT'S services during the detailed engineering phase will include identification of the requirement of PACKAGE contractor's field engineering cell, development review, and monitoring of QA and QC Plans and to review and recommend changes in the scope of work by PACKAGE Contractors and other contractors and associated extra claims if any.

5.7 REVIEW OF PLOT PLAN

The detailed plot plan of the Refinery will be reviewed by CONSULTANT during progress of detailed engineering so that civil work could proceed at site by release of appropriate areas.

5.8 HAZOP STUDY DURING DETAILED ENGINEERING PHASE

CONSULTANT shall perform final HAZOP study of the process plants and other facilities as required in Consultation with Licensor at the detailed Engineering phase of the Project. CONSULTANT will coordinate and ensure that all recommendations of HAZOP studies are implemented during construction. Further CONSULTANT shall incorporate all the necessary recommendations in the P&IDs. CONSULTANT shall also ensure that all the requirements of OISD are implemented.

6.0 PROCUREMENT SERVICES

6.1 GENERAL

CONSULTANT will monitor various procurement activities and will maintain close supervision of Procurement activities of contractors to ensure timely delivery of materials to adhere to the schedule.

CONSULTANT will monitor and expedite as necessary the overall procurement activities of the Package contractors such as vendor selection, purchasing, expediting shipping, transport, insurance undertakings, and customs clearance. CONSULTANT will maintain close supervision

6.2 BID EVALUATION OF MAJOR EQUIPMENT

CONSULTANT will review and comment on the PACKAGE Contractor bid evaluation report and recommendations for procurement of major equipment listed in the Project specification. The following are considered major equipment but not limited to:

6.2.1. STATIONARY EQUIPMENT

- a. Towers, reactors, Regenerator, Columns, Catalyst Hoppers, adsorbers, vessels and heat exchangers, etc.
- b. Internals of columns and reactors
- c. Package units complete with all auxiliaries
- d. Air-cooled heat exchangers including fans, etc.

6.2.2. ROTATING EQUIPMENT

- a. Process compressors, pumps and auxiliaries
- b. Steam turbines, gas turbines, diesel drivers
- c. Other high speed/multistage/special design pumps

6.2.3. OTHER CRITICAL EQUIPMENT

- a. UPS, VFDs, Generators, HVAC, HT/LT Switchgear, Transformers, Heavy Duty Motors, HT cables/HT Motors.

- b. DCS/ESD systems
- c. Analyzer packages
- d. Machine condition Monitoring systems & Control panels
- e. Slide valves
- f. Any other critical & special equipment as identified during Engineering.

6.3 VENDOR LIST PREPARATION

- a. CONSULTANT shall prepare and include the vendor list in the PACKAGE bid.
- b. CONSULTANT shall include in the PACKAGE bid the Licensor's vendor list for critical equipment.
- c. Vendor list prepared & recommended by the CONSULTANT shall be reviewed & approved by the OWNER.

6.4 PROCUREMENT INSPECTION SERVICES

6.4.1. CONSULTANT shall prepare the inputs for complete Inspection and Quality Assurance Program of the PACKAGE contractors, which will provide OWNER with acceptable and quality products. The Inspection test plan/ QAP shall include all the items (including non- critical items like CS fitting) to be procured by the PACKAGE and other Contractors. Additionally, the Inspection test plan/ QAP shall have the provision of 100% dimensional checks of each size, pressure rating and type of pipe fittings at vendors' works by Third Party Inspection (TPI) and 10% dimensional checks of each size, pressure rating and type of pipe fittings at site by the CONSULTANT and surprise checks by the OWNER. This Inspection test plan/ QAP shall be included in the PACKAGE bid.

6.4.2. CONSULTANT will review and recommend to OWNER for approval the above QAP/ inspection test plan to be submitted by the PACKAGE Contractor which as a minimum shall include:

- a. In-house inspection programs.
- b. Inspection procedures consistent with mandatory codes.
- c. Procedures for material identification and transportation.
- d. Certification of non-destructive testing.
- e. Independent inspection of all critical equipment at vendor's works (with approval of OWNER) and issue inspection reports along with factory acceptance test reports to OWNER.
- f. Certify invoices submitted by PACKAGE Contractors.

6.4.3. CONSULTANT may have to perform the expediting and follow-up job with vendors for critical items.

6.4.4. CONSULTANT shall cause and supervise Package Contractor to conduct management and control of shipping agencies for all transportation, handling, custom clearance, etc. for all materials to site/s.

6.4.5. CONSULTANT shall cause and supervise Package Contractor to submit monthly material procurement status and special status report of late or critical items.

6.4.6. CONSULTANT shall certify invoices submitted by Package contractors

6.5 MISCELLANEOUS PROCUREMENT ACTIVITIES

- a. Review and recommend for OWNER'S approval all procurement forms and procedures.

- b. Review of purchase orders and purchase requisition to be issued for major and critical equipment to ensure proper/complete documentation, compliance with the Project specification, spare parts and other specific requirements.
- c. Review and recommend for OWNER'S approval the material movement and handling procedures proposed for the Project.
- d. Review, analyze and recommend purchase orders for quoted delivery dates to ensure compatibility with the approved Project schedule and ability to meet site material requirements during the construction phase.
- e. Closely monitor actual delivery dates and ensure adherence to expediting functions and prepare plans for remedial actions in case of any delay foreseen in delivery of equipment/material.
- f. Ensure that the inspection and quality assurance programs are being followed and that proper documentation is provided for all equipment and bulk materials.
- g. CONSULTANT shall audit the essentiality certificates (EC), if applicable, issued to various vendors to ensure that certificates have been utilized for importing the correct material.
- h. CONSULTANT shall give recommendation on PACKAGE contractor's request for issue of Essentiality Certificate (if applicable).
- i. Expediting the critical materials by visiting the vendor shops (Indian). A report on each visit will be generated & to be submitted to OWNER / PACKAGE /Package Contractor(s). A consolidated monthly progress report shall be generated by consultant regularly.
- j. Require the immediate reporting to BPCL of all changes which will affect material quality and recommend any necessary corrective actions to be taken.

7.0 MODULARIZATION SCOPE OF CONSULTANT

Considering the project schedule to deliver the project in a fast-paced manner, it is critical to apply modularization levers. It brings several advantages, including faster construction, more predictable costs, reduced risks related to local transportation, and ultimately safer and quicker project development.

As a widely recognized best practice in modern project execution, modularization is strongly recommended by the OWNER. Therefore, it's expected that the EPCM incorporates modularization strategies extensively throughout the project to ensure efficiency and alignment with project goals.

It's imperative that the selected EPCM entity completes all tasks specified below and prioritizes the implementation of modularization wherever feasible.

7.1 General management

Logistic survey and planning: EPCM is responsible to assess all site characteristics including terrain topo, Geotech, as well as the access port, roadways, ground transportation constraints to define the min-max dimensions and weights for modularization. The outcome shall be cascaded to all sub-contractors for all sub- packages.

Modular execution plan: The EPCM is responsible to develop a comprehensive modular execution plan that will define the scope, schedule, and budget for the modularization work, it shall include but limited to modular package, develop a fabrication schedule for the modular packages and

integration with other packages, fabrication shop selection, laydown area design, QAQC plan including acceptance criteria, management team set up, construction plan etc. EPCM shall within the first 6 months from zero date submit and align a plan of modularization with the OWNER.

7.2 Engineering

The EPCM contractor will be responsible for the engineering of the modularization work. This will include but not limited to:

Modular opportunity identification: Identify scopes that potentially can utilize modular concept for design and construction according to modular execution plan.

Value engineering: Evaluate and assess both cost and schedule impact for modular scope. Select and recommend best options to implement modularization.

Package and submodule breakdown: EPCM shall develop breakdowns for modules and submodules within each of the packages for OWNER review.

Execution of detail design: Implementation of modular design concept to realize the agreed modular packages, ensure the design will facilitate future execution of modular construction work.

Based on the engineering design, consultant to identify prefabrication section of the pipes, structure or units, and work together with fabricators to develop detailed fabrication shop drawings and ensure the desired pre-fabrication ratio is achieved. For piping, the pre-fabrication ratio shall not be lower than 60%.

Joint design reviews: EPCM shall organize joint design review the scope to identify scopes that can be modularized. Where required, facilitate constructability and operability review with contractors and Owners' operations personnel.

7.3 Procurement and contracting

Fabricator Qualification: EPCM is responsible for developing qualification requirements including experience, capacity, quality and logistics capabilities etc.

Tendering Review and Evaluation: EPCM is responsible to review tendering evaluation for future modular vendors or contractors.

Quality Assurance and Control: Consultant is responsible for providing necessary QAQC oversight at fabrication shop based on the criticality of the equipment. And protocols shall be developed by Consultant for FAT and SAT.

Logistics and Preservation: EPCM is responsible to define standards for packaging and shipping sensitive components to ensure no damage in transit. EPCM is responsible to ensure appropriate equipment preservation protocols are implemented by contractors in laydown/storage areas.

Procurement Monitoring and Risk Management: EPCM is responsible for reviewing contractors' procurement status report on a weekly basis to identify any procurement delays or issues.

7.4 Construction management

Critical Equipment Oversight: EPCM is responsible for reviewing and approving lift plans, installation method of statements for critical or oversized equipment.

Quality Assurance and Control: EPCM is responsible for providing QA/QC oversight over installation of prefab modules.

Completion and Commissioning Protocols: EPCM is responsible for defining protocols for mechanical completion, pre-comms, and comms towards reactor light-off.

Additional Responsibilities: EPCM is responsible to define the Ownership of modules during various testing protocols such as hydro-test, pneumatic test for mechanical, loop checks, bump test for electrical devices etc., and responsibilities are aligned for completion tests (reliability and performance).

EPCM shall coordinate with vendors and ensure all necessary arrangements are made for unloading equipment at site before dispatching the material from vendor works. They must also coordinate with CISF and BPCL for smooth vehicular entry. It is EPCM's responsibility to ensure there is no traffic disruption in the refinery and public inconvenience in surrounding Mumbai roads due to poor coordination.

7.5 USE CASES FOR MODULARIZATION CONSIDERATION

EPCM is responsible to assess different types of modularization options, including but not limited to, the following elements specified as the minimum requirements for the implementation of modularization. The detailed assessment report shall be generated after comprehensive evaluation of pros and cons for each option and best suitable options for the various scopes of the project in order to achieve the required target schedule.

- a. Skid mounted type for small/medium equipment (e.g., product distribution terminal, weighing system, pumps, small compressors, heat exchangers, water treatment skids, Filtration units, metering stations, blending skids, analyzer house etc.)

Skid mounted type of equipment from vendor to minimize the site construction work.

- b. Modular construction of large-scale equipment (e.g., Column, preassembled towers, Reactor, Regenerator, boilers, heater modules, compressors etc.)

Erection of large-scale equipment after completion of welding, inspection, post- welding heat treatment, hydro test, and anti-corrosion process in the manufacturing plant or near the site to reduce risk and save time.

- c. Segmented modules for ultra-large equipment (e.g., cooling water, large concrete blocks etc.)

In the case of ultra-large equipment, when it is impossible to transport or erect equipment, segment modules shall be evaluated.

- d. Modular construction of large frame structures (e.g., steel structures, polymer reactor blocks, heat exchanger blocks, process equipment blocks, etc.)

Frame module blocks which integrate steel structures, equipment, piping, E&I shall be prefabricated in the manufacturing plant or near the construction site.

- e. Pipeline and Pipe racks.

Site piping pre-fabrication shops shall be set up at site with further pipe racks coming with pre-installed pipelines.

7.6 CONSTRUCTION MANAGEMENT

CONSULTANT will be responsible for effective monitoring of all construction areas of the Project. 100% coverage of the jobs at construction site shall be provided by the CONSULTANT irrespective of working hours & number of CONSULTANT'S personnel required for the same. Accordingly, it will establish requisite site organization staffed by competent and experienced specialists. Requisite number of specialized personnel shall be provided to site, as and when necessary.

Construction management shall include but not be limited to the following.

7.7 CONSTRUCTION PLANNING & PROCEDURE

CONSULTANT shall:

- 7.7.1.** Finalize co-ordination procedure between OWNER, CONSULTANT and PACKAGE Contractors.
- 7.7.2.** Establish detailed construction plans and schedules with PACKAGE Contractors to match the overall Contract schedule.
- 7.7.3.** Identify construction/field organization of PACKAGE Contractors and monitor for deployment at site including mobilization of specialist services.
- 7.7.4.** Conduct periodic review meetings with PACKAGE Contractors.
- 7.7.5.** Finalize construction codes and standards to be followed during construction.
- 7.7.6.** CONSULTANT will be responsible for effecting various construction activities to be completed as per tender specifications, quality criteria, within the agreed time schedule. For this purpose, CONSULTANT will act as overall Engineer-in-Charge at site and would therefore coordinate with all PACKAGE Contractors & OWNER for effective enabling/ interfacing functions.

7.8 CONSTRUCTION SCHEDULING & MONITORING

CONSULTANT shall:

- 7.8.1.** Review construction schedule of the PACKAGE Contractor.
- 7.8.2.** Review site mobilization plan of PACKAGE Contractor and pursue required mobilization for all manpower/resources/equipment etc.
- 7.8.3.** Monitor PACKAGE contractor's work schedule, progress against program and review of monthly progress/exception reports highlighting percentage completion of work, areas of concern with respect to schedule/inputs to be deployed and recommend corrective actions and remedial measures to overcome back log in progress.
- 7.8.4.** Review the construction work/progress regularly to ensure that the PACKAGE Contractor's allocation of number, type and quality of manpower is adequate, and to ensure that construction equipment, cranes, tools, scaffolding, lighting etc. for the execution of the work are adequate and in safe working condition.
- 7.8.5.** Verify the actual work completed by the PACKAGE Contractors and recommend to OWNER for release of each progress payment according to the contract. Monitor closely the value of work done so that the final bill value including extra works shall not exceed the contract value. CONSULTANT shall be responsible to forecast and awarding new contracts for the balance work (any revision in the contract value for item rate contract must be brought for BPCL's approval at least 2 months prior to forwarding the contractor's bill of payment, The variation in quantities may be handled with the contractor as per standard practices and variation limits or separate tendering may be resorted to based on the conditions prevailing)
- 7.8.6.** Submit Risk Analysis Report and their Mitigation plan during the Project execution to BPCL Management.
- 7.8.7.** Issue monthly cost reports, cost trends and change order analysis reports subject to timely availability of requisite inputs from OWNER and Package contractor's for their respective areas.
- 7.8.8.** CONSULTANT shall cause the contractors to submit the final bills and within 15 days of completion of work shall forward the recommendation to OWNER for release of payment. CONSULTANT

from contractors for issue of materials, hire charges, rents and taxes etc. as per provision of contracts. Wherever required CONSULTANT shall deal with contractors for expeditious settlement of extra claims, disputes etc.

7.8.9. Provide assistance to BPCL in matters pertaining to local laws, labour and public relations.

7.9 CONSTRUCTION QUALITY ASSURANCE

CONSULTANT shall:

7.9.1. Review the construction quality assurance plans prepared by the PACKAGE Contractors to ensure that they cover minimum the areas as under and confirm their compliance, to be followed with codes / standards / specifications, etc.:

- a. Site preparation
- b. Tie-ins
- c. Buildings and structures
- d. Incorporation of all witness tests and hold points of the construction work
- e. Welding/fabrication
- f. Clean-up testing/ chemical cleaning
- g. Instrumentation installation and construction

7.9.2. Stage inspection of quality of work performed by PACKAGE Contractors as per approved QA plan and contract specifications.

7.9.3. Review and audit, approved welding procedures and welders qualification procedures that are approved by PACKAGE Contractors for their works.

7.9.4. Monitor compliance of various statutory rules, regulations and safety measures and ensure PACKAGE Contractor to arrange and coordinate site inspection, testing etc. as required under local statutory rules and regulations prevalent in India.

7.9.5. Ensure PACKAGE Contractors to take all necessary precautions to protect construction work and material from damage by climate, outside elements and construction activities.

7.9.6. Alert OWNER and the PACKAGE Contractor immediately of any use of materials not in accordance with the drawings and Project specification and take immediate corrective action.

7.9.7. Review safety procedures prepared by the PACKAGE Contractors for compliance with applicable codes, regulations and OWNER requirements.

7.9.8. Review PACKAGE contractor's schemes for heavy/critical equipment's erection/lifts/rigging, before contractor effects such critical/heavy lifts.

7.9.9. Review alignment (hot/cold) of all critical rotary equipment/machinery by PACKAGE and their upkeep/maintenance as per supplier's recommendations.

7.9.10. Ensure that the PACKAGE Contractors perform good housekeeping activities which include maintaining sanitary facilities, sweeping, clean-up, removal of excess materials/temporary facilities, scaffolding as necessary. Suitable penalty clauses shall be inserted in the PACKAGE bid documents.

7.9.11. Conduct periodic Quality/Technical Audits to identify the PACKAGE Contractors work that may be unsatisfactory in quality and/or is not conforming to the contract.

7.9.12. Advise PACKAGE Contractors to take immediate appropriate corrective actions as & when such discrepancy arises to fulfill quality, safety obligations.

7.10 CONSTRUCTION INSPECTION

CONSULTANT shall:

7.10.1. Ensure that the PACKAGE Contractors make arrangements for the required field inspection and tests required by the standards/specifications under the PACKAGE Contracts and by local authorities/agencies and submit inspection procedures for review/approval of CONSULTANT/OWNER. CONSULTANT will ensure that these inspection procedures will at least include the following requirements:

- a. A construction activity will not start until all prescribed quality pre-conditions and pre-requisites have been met.
- b. The contractors will not proceed beyond identified witness tests and hold points without CONSULTANT'S clearance. CONSULTANT will plan their activities to prevent undue delays in inspection at these points. Construction schedules shall allow a reasonable time for inspection, as required.
- c. If it is observed that work is not conforming to specifications and drawings, CONSULTANT will promptly bring this information to the attention of the contractor concerned and will ensure that remedial works are carried out.
- d. In those situations, where continued work would cause damage, preclude further inspection or make remedial action ineffective, CONSULTANT'S inspection responsible for that work will have the authority to stop the work in progress. He will immediately notify OWNER and the concerned contractor of such action.
- e. All material handling equipment should be subjected to required load test, initially and then periodically, to ensure safe/stable operation including witnessing and maintaining record of all such tests.
- f. Review the results of all field inspections and tests carried out by PACKAGE Contractors that are necessary to comply with the Project specifications.
- g. Ensure that the inspector engaged by PACKAGE Contractors for carrying out radiographic inspection and interpretation of radiographs of welds is well qualified and acceptable to perform the tasks.
- h. Ensure PACKAGE Contractors to maintain a proper up-to-date documentation system of the radiographs which can identify the location of the weld and the welder concerned.
- i. Ensure PACKAGE Contractor to submit all inspection reports and files with proper cross identification to OWNER within stipulated time as per contract.
- j. Witness Hydro-test, Pneumatic and other field tests for Mechanical, Electrical and Instrumentation items.
- k. Witness review, analyze and certify all proof of proper construction provided by the PACKAGE/ other contractors to ensure compliance with the Project specifications.
- l. Witness and certify the final inspections of equipment by the PACKAGE Contractor(s)/ other contractors.

- m. Ensure that all inspection reports and files with proper cross identification with field materials are handed over to OWNER within one (1) month after completion of Mechanical Completion of any part of the Project.
- n. Any other work required to ensure construction quality as envisaged in the design/specifications.

7.10.2. SPECIAL REQUIREMENTS

- a. CONSULTANT shall Inspect and certify the piping supports. Load data of spring supports shall be recorded and certified and necessary adjustments for unlocking of spring supports shall be made prior to commissioning by the CONSULTANT.
- b. CONSULTANT shall Inspect & certify the short bolting prior to commissioning. Records of bolt tightening for high pressure lines shall be certified by the CONSULTANT.
- c. Consultant will develop a phased mechanical completion program to facilitate sequential pre-commissioning activities in a logical manner.
- d. CONSULTANT will ensure that the contractors submit the Completion Manual, which will contain a forms and procedures for systems testing to achieve Mechanical Completion. Consultant will review this systems completion Manual and recommend to BPCL for approval.

7.10.3. CONSTRUCTION QUALITY AUDIT

- a. CONSULTANT shall carry out a Construction Quality Audit of the project facility every three months during construction phase of the project by an independent group of CONSULTANT'S personnel not reporting to the site in-charge. The audit shall employ special tools such as positive material identification, through alloy analyzers etc.
- b. An additional audit of total piping system shall also be carried out by CONSULTANT'S piping specialist group.

7.10.4. CONSTRUCTION RISK ANALYSIS REPORT

CONSULTANT shall carry out a Risk Analysis on the Construction activities regularly and publish a monthly progress report on the Risk Analysis, perceived and the Mitigation plans. Monthly update on the Analysis also to be given for corrective actions.

8.0 MATERIAL CONTROL AND WAREHOUSE MANAGEMENT

CONSULTANT shall perform the following activities:

- 8.1** Review/audit receipt of equipment and materials at site, ensure proper site inspection and storage by PACKAGE Contractors, ensure all steps are taken to avoid any intermixing of materials and with other project material.
- 8.2** Prepare Material receipt status and inventory status at Site with relation to material delivery schedule.
- 8.3** Develop Material Control Plan / procedure of PACKAGE Contractors.
- 8.4** Issue reconciliation statement on completion of WORK to enable OWNER take over the balance materials including coordination of the activity till completion. All such materials shall get codified through PACKAGE Contractors as per SAP code along with cost of materials etc. before handing over the same to the OWNER.

9.0 SPARE PARTS MANAGEMENT

The following activities will be performed by the CONSULTANT:

- 9.1** Checking and approving the quality and quantity of spare parts and other supplies to be made available by the Contractor(s) to ensure compliance with the construction contract requirements and supervision of their handing over to OWNER.
- 9.2** Recommendations of spare parts inventory and future ordering schedule for safe conditions/trouble free operation.
- 9.3** CONSULTANT will advise OWNER for establishing necessary Electrical Testing & Instrumentation lab with recommendations of appropriate testing equipment.
- 9.4** CONSULTANT shall develop spare parts lists considering BPCL unique spare philosophy for Commissioning spares, Mandatory spares and Operation & Maintenance Spares for each equipment & piping system in consultation with OWNER for inclusion in PACKAGE bid document(s).
- 9.5** CONSULTANT shall check the list of Spare Parts and other supplies to be made available by the PACKAGE Contractor to ensure compliance with the contract requirements and ensure their handing over to the OWNER. CONSULTANT shall also recommend Spare Parts inventory and future ordering schedule for trouble free operation of the PLANT.
- 9.6** Suitable clause(s) shall be incorporated in the PACKAGE bids for handing over of the Spares/surplus materials including assistance for Creating the BPCL SAP Codes on a regular basis during the Project and handing over the Spares at least 3-6 months before the Schedule of Mechanical Completion.
- 9.7** For Rotary Equipments, all the spares required for the future maintenance shall be coded in the existing CMT format and the procurement shall be done with the CMT code and shall be stored in the Warehouse.

10.0 PRE-COMMISSIONING, COMMISSIONING AND PERFORMANCE TEST RUN

10.1 GENERAL

The CONSULTANT shall provide necessary assistance to OWNER in planning and organizing pre-commissioning, commissioning, start-up and performance test run of the Project facilities. The Scope of Work will comprise but not be limited to the following:

- 10.1.1.** Carry out system checking to ensure correctness to avoid / reduce check list & punch list from licensor.
- 10.1.2.** Set-up, review and implement start-up program.
- 10.1.3.** Review of pre-commissioning, commissioning and standard procedures for start-up, normal operation, shutdown and handling of abnormal situation.
- 10.1.4.** Review PACKAGE contractor's operating/instruction manuals for each unit based on process licensor's manuals/information, data from equipment vendors etc.
- 10.1.5.** Coordinate and supervise commissioning schedules, start-up schedule etc. with PACKAGE contractors, other agencies and OWNER
- 10.1.6.** Review punch/check lists and monitoring the execution of the Punch list and generate regular status reports as agreed.
- 10.1.7.** Supervise pre-start up inspection of all equipment and systems including certification of its proper functioning.

- 10.1.8.** Conduct safety audits of the entire plant (for each unit) and prepare checklist / get corrected the discrepancies before pre-commissioning activities can be started.
- 10.1.9.** Ensure adequate manpower, special tools and spare parts necessary for assisting commissioning activities such as:
 - a. Operational tightness testing.
 - b. Pre-startup inspections
 - c. Loading of chemicals and catalyst
 - d. Filling of lubricants
- 10.1.10.** Assist pre-commissioning audit nominated by the OWNER.
- 10.1.11.** Assist in Pre Commissioning Safety Audit.
- 10.1.12.** Conduct all checks as per API 700.
- 10.1.13.** Statutory audits (Pre-commissioning Safety Audit) like OISD will inspect the plant for clearance for commissioning and any recommendations by such audits will need to be executed by CONSULTANT.
- 10.1.14.** Liquidation of checklist recommended by Process Licensors.
- 10.1.15.** Prepare project close up report.
- 10.1.16.** Finalize commissioning schedule, in CONSULTANT with OWNER/ Licensor.

10.2 PRE-COMMISSIONING

Ensure that all the pre-commissioning/commissioning activities of the Project are carried out by PACKAGE contractor/other agencies in accordance with established procedure, schedules and program, as detailed below:

- 10.2.1.** Hot alignment checks and running of rotating equipment.
- 10.2.2.** Alignment of Rotating Equipment (Alignment reading in the laser alignment computer to be submitted)
- 10.2.3.** Vibration readings of all rotary equipment (Base reading to be submitted in the soft copy)
- 10.2.4.** Equipment operation checks e.g. vibration, trips, functioning of safety devices and other required operating tests and adjustments. CONSULTANT shall witness & certify the testing of all SRVs & TSVs.
- 10.2.5.** Flushing, blowing and chemical cleaning.
- 10.2.6.** Installation of temporary screens, strainers, and blinds.
- 10.2.7.** Adjustments and replacements, if necessary, of mechanical seals, packing and accessories as required.
- 10.2.8.** Necessary purge operations, including installation of temporary purge piping or hoses to equipment connections.
- 10.2.9.** Checking of bores of orifice plates and installing them after flushing operations.
- 10.2.10.** Pre-commissioning checks of all electrical equipment and energization of electrical equipment.

- 10.2.11. Instrument calibrations with standard test equipment and all required adjustments and control point settings.
- 10.2.12. Functional check on all instruments and controllers.
- 10.2.13. SIL level verification for individual Safety Instrumented Function.
- 10.2.14. Complex control loop verification and Interlock checking
- 10.2.15. Cybersecurity compliance verification
- 10.2.16. Check all instrument loops for proper functioning.
- 10.2.17. Checking and recording positions of all valves.
- 10.2.18. Checks on pipe hangers, supports; and guides for hot/cold settings and necessary adjustments.
- 10.2.19. Drying of refractories of furnaces, stacks and heat recovery sections.
- 10.2.20. Ensure that all defects and deficiencies found during the course of Commissioning shall be rectified by the PACKAGE contractor.
- 10.2.21. Preparation of operation and maintenance manual for open art units, utilities & offsites.
- 10.2.22. Checking of operation and maintenance manual of licensed units prepared by Licensor/ PACKAGE contractor.
- 10.2.23. Checking the availability of spares for pre-commissioning & commissioning.
- 10.2.24. Collection of base data for future predictive and preventive maintenance.
- 10.2.25.
- 10.2.26. Assist BPCL in OISD pre-commissioning safety audit.

10.3 COMMISSIONING

The CONSULTANT will undertake the following jobs:

- 10.3.1. Supervision/ monitoring of check-up and calibration of the various instruments to be used in plant system commissioning and testing.
- 10.3.2. Supervision of all activities for commissioning and testing of various systems in accordance with the startup schedule.
- 10.3.3. Preparation of a check list of all defects and chalking out program for their correction and completion.
- 10.3.4. Development of criteria for Initial and Final Acceptance.
- 10.3.5. Analysis and evaluation of the test results obtained during testing and commissioning in order to determine actual performance of equipment, units w.r.t. both Licensor's and Vendor's guarantees.
- 10.3.6. Review and approve the performance test and advise OWNER on the procedures provided by PACKAGE and other contractors/Licensors and specify, among other things, the following:
 - a. Operating data to be recorded in a log sheet
 - b. Sampling methods
 - c. Analytical methods
 - d. Methods of calculations

- e. Interpretation and measurement of tests
- f. Manner of taking operating data and its frequency
- g. The manner of evaluating the performance of the unit, raw material consumption, utilities consumption and energy consumption, yields etc. including appropriate corrections if any. LAB tests to ensure quality of products
- h. Safe commissioning of unit/ monitoring of condition till stable-operation.

10.4 PERFORMANCE TEST RUN

CONSULTANT to ensure that performance test of all units are conducted in accordance with the (conditions as laid down in the contract), professional engineering practices, plant safety and operating standards.

- 10.4.1.** To demonstrate the units, meet the CONSULTANT/LICENSOR guarantees, one or more performance test-runs shall be carried out under the technical direction of CONSULTANT/LICENSOR.
- 10.4.2.** The performance test-runs shall be carried out in accordance with the detailed program to be drawn by CONSULTANT in mutual consultation with OWNER and would be conducted under normal operating conditions.
- 10.4.3.** Within five days after successful completion of the test-run, all operating conditions, figures, actual achievements should be recorded. The format for the same will be developed by the CONSULTANT in discussion with the OWNER.
- 10.4.4.** On completion of performance test runs, prepare independent report for OWNER on performance of each unit with recommendations (in consultation with Licensors and OWNER) on ways and means of improving performance.
- 10.4.5.** CONSULTANT will evolve formats for handing over of plants to OWNER including all required documentation, completion certificates etc.

11.0 PROCESS GUARANTEES, RECTIFICATION AND DEFECT LIABILITY

- 11.1** All works by PACKAGE and other Contractors with reference to the Project will be subject to a Defect Liability period during which the PACKAGE Contractor(s)/other Contractors would be liable to correct, repair and/or rectify any and all defects and/or imperfections in the design of the work (in so far as the Contractor shall be concerned with the design of the work or any part thereof), in the work performed and/or in the materials components or other items incorporated therein. CONSULTANT shall, upon the written request of the OWNER, undertake such supervisory and/or consultancy services as may be required to monitor the Defect Liability obligations of PACKAGE Contractor(s) / other Contractors and/or to ensure that PACKAGE Contractor(s)/other Contractors perform in accordance with the requirements the corrective work, repairs and/or replacements necessary to rectify defects and/or imperfections.
- 11.2** In addition, process licensors involved in the various processes incorporated in the Plant would have given guarantees covering various aspects of their respective processes. It is anticipated that the Plant may be tested, commissioned and operated by the OWNER even though some of the process guarantees have not been met, pending performance of fix-it or other rectification obligations by the concerned Process Licensor(s) and/or PACKAGE Contractor(s)/other Contractors. It shall be the responsibility of CONSULTANT to evaluate and review any corrective measures in design and engineering suggested on this behalf and to supervise and monitor implementation thereof or any re-

test(s) as are necessary until the process guarantees have been met or discharged in accordance with the provisions of relative contract.

12.0 HEALTH, SAFETY & ENVIRONMENT

- 12.1** CONSULTANT shall develop comprehensive specification for Health, Safety & Environment protection and the same is to be made part of all PACKAGE bids.
- 12.2** CONSULTANT is responsible for ensuring adherence of all safety requirements by PACKAGE contractor.
- 12.3** Consultant shall be responsible for Good Housekeeping by the PACKAGE contractor(s). Necessary clauses shall be inserted in the PACKAGE bids along with penalty for violation if any.

13.0 MISCELLANEOUS

CONSULTANT shall perform the following jobs:

- 13.1** Perform all repetitive jobs involving revision of drawings, any re- tendering etc. Within the quoted price.
- 13.2** Prepare Revised / updated documents such as P&IDs, Data Sheets etc. in electronic form.
- 13.3** Documentation, coordination & Liaisoning with State Govt., TAC/CCE/ Boiler Inspector, Electrical Inspector/ Lift Inspector and other statutory authorities for approval.
- 13.4** Preparation and development of final plot plan of the unit based on the information furnished by the Licensor so that it meets all statutory and safety requirement. Further, CONSULTANT shall develop and optimize overall plot plan showing all units and facilities including main pipe ways/ pipe racks, roadways, construction access, temporary storage area & construction area etc. CONSULTANT shall provide the required services for enabling works for locating the Plant.
- 13.5** Archives management.

14.0 COMPUTER SOFTWARE/ COMMUNICATION REQUIREMENT

- 14.1** Entire plant shall be designed on a computer based reputed "Plant Design Systems" on Windows platform to furnish the following:
 - a. Plot plan
 - b. General Arrangement Drawings (GAD's)
 - c. Isometrics
 - d. Bill of materials
 - e. 3D model of the plant

Consultant shall prepare the model of all the facilities (including all OWNERS facilities) in an integrated & intelligent 3D software solution using rule-based, data centric 3D Design software with equipment drawings, data sheets, intelligent P&ID correlated with intelligent 3D Model, BOQ, schematics and logic diagrams etc. attached to the respective equipment / systems in the aforesaid 3D model. Consultant shall make a presentation on 3D model every 3 months from LOA to enable BPCL to review the progress of engineering. After the completion of engineering of respective areas, the corresponding complete 3D review model shall be handed over to the employer for its reference. Consultant shall provide 3D design review model (network ready, which shall include visual interference check, walk-through animation, video simulation for major equipment placement and removal, visual effect, photo realism etc.), which is extracted from intelligent 3D model, for employer's review as & when desired by employer. Carry out 3-D modelling in PDMS and hold

stage wise model review at 30% & 60%, at Consultants Office and 90% at BPCL. Furnish updated /as built 3D model at the end of project. However, all piping layouts, equipment layouts, floor plans, ducting layout (Air/flue gas, AC, Ventilation etc.), structural arrangement drawings and RCC layout drawings shall necessarily be extracted from the aforesaid 3D model and submitted for employers review along with the 3D review model to enable BPCL to review and approve these drawings. The solution shall be able to provide reporting capabilities utilizing 3D models (e.g. Progress / Construction status reporting in a web-enabled environment with inputs from Project Management solution such as Primavera / MS Project.

The solution shall provide integrated reporting service to create interactive, tabular, graphical, or free-form reports as well as the ability for reports to contain drilldowns and dynamic links. The solution shall provide a standard set of reports:

- i. Attribute Completeness
- ii. Attribute Inconsistencies
- iii. Attribute Inaccuracies
- iv. Data Validation
- v. Tag Document Completion
- vi. Tag Source.

- 14.2** 3D model for the entire plant facilities shall be developed with dynamic walk-through facility to check any interference, requirements of operation and maintenance and demonstrated and got approved by the OWNER. CONSULTANT shall ensure and cause PACKAGE Contractor to demonstrate their capability through walk-through of one of such 3D models developed by them.
- 14.3** CONSULTANT shall ensure that facilities for viewing & modification of the Plot Plan, Drawings, 3-D Model etc. are available at 'CONSULTANT'S and PACKAGE Contractors' respective site offices. Also, the CONSULTANT, within the scope of services envisaged, facilitate the OWNER to install such facilities in the OWNER'S site office.
- 14.4** CONSULTANT shall ensure availability of Electronic Data Communication (EDC) system and other modes of communication such as video conferencing, video projectors etc. in CONSULTANT & PACKAGE Contractors' respective offices (Home, Design & Site). Also, the CONSULTANT, within the scope of services envisaged, facilitate the OWNER to install such facilities in the OWNER'S site office.
- 14.5** PERT Network and other project planning documents shall be done on Primavera and/or MS Project Planner or Project Scheduler.
- 14.6** All text data shall be on MS Word in Windows 10 or higher
- 14.7** All Spread sheet work shall be on MS Excel in Windows.
- 14.8** All other documents like presentations etc. and other data shall be in MS Office in Windows 10 or higher
- 14.9** All drawings shall be furnished in PDMS format
- 14.10** All the above drawings and documents shall be delivered in required copies on scratch proof CD's along with hard copies.
- 14.11** All PACKAGE documents shall be furnished on separate compact discs, and the contents shall be in MS office compatible packages

14.12 For Instrumentation items, all vendor documents shall be handed over to OWNER in Smart Plant Instrumentation (SPI) format, for OWNER to upload the same in their LAN/WAN.

15.0 General

15.1 It is Consultant's responsibility to develop, and co-ordinate require Hook-up drawings, like tie-in points of conventional battery limit (this includes instrumentation, Electrical, Utilities, Process etc.) which are needed for individual PACKAGE Contractor(s).

15.2 It is Consultant's responsibility to develop PMS (Piping Material Specification) and VMS (Valve Material Specification) for all PACKAGE packages to meet Process requirement as per standard engineering practices, whether it has been provided in Process Package or not. In case it has not been given by Process Licensor, it shall be developed by consultant and shall incorporate in FEED document for PACKAGE bidder.

ANNEXURE-III**INDICATIVE CONTENTS OF BASIC DESIGN ENGINEERING PACKAGE****1.0 INTRODUCTION**

- 1.1** The Basic Design Engineering Package (BDEP) which will be prepared by the LICENSOR shall contain adequate process and mechanical design data and information necessary to enable a competent engineering/ construction contractor to undertake and proceed with the detailed engineering, procurement, construction and commissioning of the unit. All documents are to be prepared with sound design and engineering standards followed in hydrocarbon industry. LICENSOR to note that the BDEP should comprise of all the data that is required to carry out detailed engineering by detail engineering contractor. Complete design basis comprising of Part-A and Part-B which shall form the basis of BDEP preparation. Part-A design basis constitutes of unit design basis providing necessary data for the specific process unit. Part-B design basis defines overall project requirements for making all units compatible and ensuring uniform design practices for the total complex. The design basis Part-B shall be discussed during kick-off meeting and the general requirements of the complex which are applicable to the unit shall be agreed and complied by LICENSOR.
- 1.2** The scope of deliverables shall be in strict conformance with the details given in this document. In case some of the deliverables listed herein do not form part of the usual basic engineering package, for this specific project, LICENSOR shall make necessary arrangements to satisfy the complete scope of BDEP as defined herein. Licensor to furnish the yield data & utility consumption, PFD, Heat & Material Balances and product qualities for all the design cases and check cases in the BDEP.
- 1.3** Hydraulics shall be performed as per the equipment layout agreed and finalized during PFD review stage.
- 1.4** All documents shall be in accordance with the Project specifications. Metric system of units shall be used for all deliverables (except for pipe and nozzle sizes in inches) with the only exception being extended to LICENSORS own standards which are issuable with their existing units of measurement. Wherever LICENSOR's own engineering standards are to be necessarily followed with respect to equipment design, piping design, instrumentation design, etc., the same shall be issued to OWNER as part of BDEP at no extra cost.
- 1.5** Final Basic Engineering Design Package (BDEP) and operating manuals shall be submitted in 8 copies each. The complete package will also be supplied in editable soft form for the DEC to update during execution.
- 1.6** LICENSOR shall also provide soft copies of PFDs, P&IDs and Full process BDEP. All Drawings/documents shall be executed on software such as Microsoft word, Microsoft Excel, AutoCAD, SMART Plant P&ID etc., as per requirement specified below:
- a. All P&IDs are to be developed as Smart P&IDs with required database. Version of software shall be latest version. Any additional information shall be decided and finalized during KOM.
 - b. Develop all other PFD's and engineering drawings using AUTOCAD (Latest Version)
 - c. All drawings to be given in editable soft form.
 - d. All drawings shall be made in layer concept and not in single layer basis. Layers to be assigned shall be decided during kick-off meeting stage.

1.7 One list and Equipment/ Instrument Data Sheets shall be provided in MS Excel.

1.8 The contents of BDEP shall be, but not necessarily limited to, in accordance with the details described in subsequent sections.

2.0 BASIS OF DESIGN

2.1 The Basis of Design (BOD) will provide all the information agreed upon between LICENSOR and OWNER upon which the design and engineering will be based. It will contain the following minimum information as applicable:

- a. Plant definition including function and scope of the unit.
- b. Plant capacity, turndown ratio and on-stream hours per year.
- c. Definition of cases (design/ alternate check cases)
- d. Feed stock source and specifications highlighting limiting specifications and their impact on unit design.
- e. Products and their desired target specifications and destinations.
- f. Estimated and guaranteed products and effluent qualities
- g. Operating conditions of the major equipment
- h. Specific design criteria and basis of selecting critical parameters.
- i. Battery limit conditions.
- j. Utility source and specifications.
- k. Environmental requirements.
- l. Safety requirements.
- m. Codes and standards followed.
- n. Site location and infrastructure requirements.
- o. Local meteorological conditions.
- p. Units of measurement.
- q. Drawing standards.
- r. Special OWNER requirements, if any.
- s. Schedule of deliverables including advance release of critical Equipment data
- t. Co-ordination procedure

3.0 PROCESS DEFINITION

3.1 PROCESS DESCRIPTION

A detailed process description of the unit following the Process Flow Diagrams shall be provided. This shall also include a description of the reaction chemistry, kinetics, range of critical operating parameters and their impact on product quality and operability, energy consumption, etc.

3.2 PROCESS FLOW DIAGRAM

The Process Flow Diagrams (PFDs) shall show the functionality of the unit, with all process streams, process equipment, main utility streams and process control philosophy. PFDs should be prepared for each of the cases for start of run and end of run conditions.

- a. The following minimum information will be shown on the diagrams:
- b. Process flow with all process streams (including start-up lines) and main utility streams (where they influence process configuration). Intermediate streams such as compressor interstage etc., also to be indicated in the PFD.
- c. Main control loops and instrumentation necessary for understanding the process and utility systems regulation philosophy. Where a PFD is inadequate in explaining the complete control and interlock philosophy or as per LICENSOR standard philosophy, Process Control Diagrams (PCD) shall be additionally generated and issued along with PFD at review stage itself.
- d. Normal operating conditions of major process streams including temperature and pressure profiles along with flow rates.
- e. Equipment number and equipment name shall appear for all major equipment including number of shells for exchangers and number of bundles for air coolers.
- f. Number of passes and functional outlines of convection and radiation section, coil arrangements consistent with furnace efficiency improvement strategies such as steam generation, steam superheating, etc. for fired heaters.
- g. Diagrammatic outlines of columns, vessels and reactors indicating operating pressure and temperature at key locations like top, bottom, flash zone and including details of trays, packed sections and other internals, relative location of feed / product and other nozzles, etc.
- h. Functional depiction of heat exchangers indicating operating duties and types of exchangers such as air cooler, shell & tube, plate or spiral, double pipe etc. Allocation of shell and tube side streams.
- i. Functional depiction of pumps and compressors indicating normal flows and types of pumps and compressors such as centrifugal, reciprocating, etc. Driver details in case of turbine driven (Extraction/ condensing)
- j. All process and utility streams shall be numbered. The numbering shall correspond to Heat and Material balances. When there is a change in temperature, pressure or flow rate of the stream, a new stream number shall be assigned. The enthalpy and material balance information issued with PFD's shall have complete thermo- physical and transport property data for all numbered process streams.
- k. All incoming and outgoing streams shall be flagged showing battery limit pressures and temperatures and indicating their source/ destination.
- l. Preferably stream details to be provided at the bottom of each PFD
- m. Broad specifications of equipment required are as follows:
 - i. Reactors:
 - Item number

- Service
- Diameter & Height

ii. Columns:

- Item number
- Service
- Diameter & Height

iii. Vessels:

- Item number
- Service
- Diameter & Height/ Length

iv. Heat exchangers:

- Item number
- Service
- Normal duty

v. Air Cooled Exchangers:

- Item number
- Service
- Number of bundles
- Normal duty

vi. Furnace:

- Item number
- Service
- Normal duty (absorbed / fired)

vii. Pump:

- Item number
- Service
- Capacity
- Differential head
- Power

viii. Compressor:

- Item number
- Service
- Capacity

- Differential head
- Power

ix. Silos:

- Item number
- Capacity

x. Pneumatic Conveying System:

- Item number
- Capacity

3.3 OVERALL UNIT BALANCE AND PRODUCT PROPERTIES

An overall unit material balance shall be provided for each of the design and check cases for start of run and end of run conditions. This overall balance shall include all feed streams to the unit and all product streams from the unit. Section-wise material balance and stream-wise material balance report with component break-down shall be provided as required. It shall also include a list of all relevant product properties.

3.4 HEAT AND MATERIAL BALANCE

Heat and Material Balances shall be provided for all design and check cases for each revision of PFD and will include as a minimum the following information:

- a. Stream number (corresponding to PFD).
- b. Stream name and phase of fluid.
- c. Total mass & volume flow.
- d. Total Component-wise Mass Flows and Total Stream Enthalpy
- e. Normal operating temperature.
- f. Normal operating pressure.
- g. Density of fluid at operating conditions. (Vapour and Liquid separately for 2- phase streams)
- h. Specific gravity of liquid components.
- i. Molecular weight of vapor components.
- j. Kinematic Viscosity at operating conditions. (Vapour and liquid separately for 2- phase streams)
- k. Thermal conductivity at operating conditions. (Vapour and liquid separately for 2- phase streams)
- l. Specific heat at operating conditions. (Vapour and liquid separately for 2-phase streams)
- m. Cp/Cv, Compressibility Factor of Vapour
- n. Surface Tension
- o. Critical temperature and critical pressure.

- p. Stream composition in both weight and mole basis (Vapour and liquid separately for 2-phase streams)
- q. Stream enthalpy (Vapour and liquid separately for 2-phase streams)
- r. Percentage of free water
- s. True Vapor Pressure
- t. H₂/H₂S content and other trace components of relevant streams that may affect the selection of MOC (Vapour and liquid separately for 2-phase streams)
- u. Latent heat of vaporization of each stream.

For mixed phase streams, the vapour and liquid phases along with above listed properties will be shown separately. For the total stream: average enthalpy, viscosity, mixed density and mol. wt. shall also be given. Weight % of vapour & free water shall be indicated.

PFD shall include overall Material Balance for design/ check/ operating cases for SOR/EOR condition.

3.5 PROCESS CONTROL PHILOSOPHY & DIAGRAMS

The control philosophy shall cover complete depiction/ explanation of critical and complex controls of the individual sections of the unit indicating all instrumentation for the unit operations inclusive of start-up, shutdown, emergencies, etc. The description of the control philosophies shall be aided by Process Flow Diagrams/ Process Control Diagrams (PCD). Advanced process control strategies, if employed, shall be specifically elaborated.

4.0 MECHANICAL DESIGN

4.1 MATERIAL OF CONSTRUCTION

Material Selection Diagrams (MSDs) shall be prepared (colored) showing the design temperature and pressure and selected materials of construction of all equipment (including internals) and piping including utility side, with corrosion allowance and cladding requirements in sufficient details. Maximum operating temperature scenario shall also be mentioned in the MSD. All equipment data sheets shall clearly detail special requirements, if any like Wet H₂S service, NACE, PWHT, H₂ service etc. and other impurities for determining the MOC's. All information for material selection must be included in MSD, P&ID's (in PMS selection) and spec breaks. Equipment datasheets must have complete specification of MOC's as per MSD. MSD's are required for any additional insight.

5.0 UTILITIES, CHEMICALS AND CATALYSTS

5.1 UTILITIES

Utility summary shall be provided to cover estimated normal and maximum utility consumption and/or production of the following utilities at process design/ operating conditions:

- a. Service Water (Raw Water).
- b. Boiler Feed Water.
- c. Demineralized (DM) Water.
- d. Cooling Water.
- e. Steam at each level (VHP/HP/MP/LP).

- f. Condensate (of different types i.e., pure, suspect, surface, etc.).
- g. Blow down Streams to atmosphere, flare etc.
- h. Electric Power
- i. Nitrogen (Inert Gas).
- j. Bearing Cooling Water
- k. Caustic Solution
- l. Instrument Air and Plant Air.
- m. Fired Fuel Gas/ Fuel Oil (considering 100% single or combined firing in any ratio of gas to oil).
- n. Natural gas (RLNG)

The estimates are to be provided as minimum, normal and maximum. Apart from continuous utility requirements, complete data must be given on intermittent utility requirements during start-up, shut down, catalyst regeneration (in case applicable) and emergencies, etc. Some items of the utility summary require vendor design information such as steam for turbines or power for pumps. In such cases, LICENSOR shall use good engineering judgment or in-house data in arriving at the estimates.

In case due to requirements of the specific process technology or in order to safeguard the facilities by bringing them to a safe shutdown condition, or for any other reason, some utilities (like electric power, cooling water, steam, etc.) are required to be made available to the unit during a general power failure, the same shall be clearly indicated by the LICENSOR in the BDEP. The information provided shall cover the following as a minimum:

- i. Names of utilities required during a power failure (like HP Steam, LT Power, Cooling Water, etc.). Instrument air will be available for 30 minutes after a power failure to facilitate safe shut-down of the unit.
- ii. Whether these utilities are required on an uninterruptible basis or they can be restarted after some time upon demand.
- iii. Duration for which these emergency utilities are required. In case Instrument air is required for more than 30 minutes, same shall be indicated.
- iv. Emergency operations to be performed and equipment to be operated using these emergency utilities.

Utility flow diagrams and summary for steam shall be submitted for all possible operating scenarios including start-up, shutdown, tripping of steam user, power failure, etc.

5.2 CATALYSTS, ADDITIVES AND CHEMICALS

Complete Catalyst properties like trade name and manufacturers, function, characteristics including bulk density, metal content, gravimetric and volumetric analysis of loaded catalyst, catalyst quantity (including contingencies), expected cycle length and ultimate life, list of vendors, etc., shall be given. Chemical name, function, characteristics including bulk density, initial load and annual consumption shall be given. This information will also be provided for additives, adsorbents, inert balls and grading materials. Recommended method of loading and disposal methods shall also be provided.

LICENSOR shall provide adequate definition of storage and handling requirements, additive/chemical injection requirements such as normal and maximum dosing rates, delivery pressure and temperature, dosing pattern/frequency, properties which have to be necessarily specified, etc., with which a detailed engineering contractor can develop the full system design without reverting to LICENSOR.

Chemical name, characteristics, function, initial load, annual consumption, handling precautions, injection rate, concentration, etc., shall be given for additives and chemicals. For specialty additives and chemicals, list of vendors needs to be included. Chemical/ additive requirement during normal operation, start-up, shutdown and regeneration shall be summarized.

Chemical neutralization/passivation requirements to be identified and suggestions for disposal of passivation effluent to be provided based on earlier experience. Overhead corrosion control should be non-sodium-based chemical to overcome the problems envisaged in effluent treatment.

MSDS for catalysts, additives, adsorbents, specialty chemicals etc. shall be provided.

6.0 PROCESS EQUIPMENT DATA

6.1 PROCESS EQUIPMENT LIST

A Process Equipment List shall be provided showing the following information:

- a. Equipment name/ tag number.
- b. Equipment type and service.
- c. Special remarks. This will include information like critical or proprietary items including vendor lists, specific testing and acceptability criteria, If any.
 - i. Whether the equipment is a Long Lead Item.
 - ii. Single vendor items should be listed and reason of single vendor to be specified.

6.2 EQUIPMENT SPECIFICATIONS

6.2.1. Specifications for equipment shall be provided with the following, but not limited to, points:

- a. Each equipment, major as well as minor, proprietary or otherwise, shall be specified through individual Equipment Process Data Sheets.
- b. Each datasheet shall carry a separate document number and include equipment name, service and identify the case to which the data corresponds.
- c. Data sheets shall include information on process fluids including physical properties, operating conditions and mechanical design conditions.
- d. Sketches showing shape, dimensional details of internals and other design information shall be provided for static equipment. Information in the data sheets shall be sufficient to carry out detailed mechanical design.
- e. Arrangements for steaming/ Vacuum Design/ Nitrogen blanketing of vents, drains, etc., for making the equipment (including heat exchangers) free of hydrocarbons shall be shown in the P&IDs and data sheets.
- f. Data sheet to be provided for controlling case, Additional cases will be shown for proper design of equipment wherever relevant. Also defined design cases must be included in

data sheet. In case intermittent or alternate operating cases (for example in-situ catalyst regeneration, emergency depressurization, etc.) dictate selection of equipment or some component thereof, then the impact of the same shall be reflected appropriately in the equipment data sheet.

- i. Equipment list and specifications will be reviewed by OWNER and OWNER's consultant to identify equipment for which performing fatigue analysis will be necessary. This list will be shared with LICENSOR and LICENSOR will provide all data necessary for performing fatigue analysis of these equipment.
- g. All requirements of Design Basis Part B as applicable to the design of equipment shall be incorporated in their specifications by LICENSOR.
- h. In case steam tracing is required for some equipment, details of steam coil, i.e., size, pitch, number of turns and number of coils will be included in the data sheet.
 - i. For all equipment to be designed as per Indian Boiler Regulations (IBR) requirements, a note shall be included by the LICENSOR stating, "IBR applies". Details of IBR requirements to be followed will be provided to LICENSOR during Kick-Off Meeting.

The information to be provided for specific types of equipment is given below:

6.2.2. HEAT EXCHANGERS/AIRCOOLERS

- a. Process conditions including fluid flow rates with breakup of vapour/ liquid/ steam/ water/ non-condensable, density, viscosity, thermal conductivity, surface tension (for two-phase conditions), critical temperature and pressure (for re-boiled streams), Mol Wt (if vapour), specific heat, over capacity on flow and duty etc.
- b. Operating temperature and pressure for inlet and outlet streams.
- c. Heat transfer duty and any limitations with respect to fluid velocity, heat flux, etc. to be included
- d. Vaporization & condensation data including critical pressure/ temperatures shall be provided as required for exchangers encountering two phase flow for carrying out thermal design.
- e. Mechanical design conditions. LICENSOR shall follow good engineering practice in evaluating system hydraulics and accordingly fix mechanical design conditions. It shall be reasonably ensured that such design conditions will not require to be revised upwards during Detailed Engineering.
- f. Fouling factors
- g. Materials of construction and corrosion allowance (for shell and tube side components).
- h. Type of exchanger/ number of shells.
- i. Insulation requirement and insulation thickness shall be indicated.
- j. Allowable and permissible pressure drop.
- k. Permissible pressure drop (specified based on past experience or in-house data of Bidder unless thermal design is under Bidder's scope). The same data should have been used in unit hydraulics executed by Bidder. When a group of exchangers say multiple shells in

series, together are to be designed within a pressure drop limit, the same shall be indicated. Any preference/ limitation in stacking of heat exchangers also to be indicated, where applicable

- l. For proprietary heat exchangers, for which detail/mechanical design are included in LICENSOR's scope as per agreed scope of engineering services, the details shall be complete to the extent relevant and necessary for procurement as per industry practice.
- m. Number of fans and sections for air coolers, standard mechanical specifications and design temperature & pressure requirements.
- n. Type of control required in air cooler
- o. Schematic arrangement of shells/ bays and special piping requirements for inlet and outlet manifolds etc., if any (for e.g. distance, symmetrical arrangement etc.)
- p. For congealing services, i.e., services handling fluids having their pour point below minimum ambient temperature, LP steam coils for preheating the air to a temperature at least equal to the fluid pour point before it enters the air cooler shall be provided. Hot air recirculation will not be specified for the air-cooled exchangers.

6.2.3. PUMPS

- a. Process conditions such as minimum, normal and maximum required flow rates/ normal & upset suction & discharge conditions/operating temperature & pressure, rated discharge pressure and NPSH available.
- b. Fluid density, viscosity, pour point, vapour pressure and annotations towards presence of toxic, corrosive or erosive materials.
- c. Mechanical design conditions. LICENSOR shall follow good engineering practice and typical vendor information in specifying these. It shall be reasonably ensured that such design conditions are not required to be revised upward during detailed engineering.
- d. Materials of construction, corrosion allowance of casing & internals and insulation / tracing requirements.
- e. Number of operating & spare pumps.
- f. Type of pumps
- g. Recommended type of pump drive for main and spare pumps and estimated brake KW, assumed efficiency, Estimated utility of driver
- h. Requirement of VFD, Auto start, reacceleration, Emergency power supply
- i. Capacity control and ranges where relevant.
- j. Differential head.
- k. Type of seal (Single / Double) and Recommended API seal Plan
- l. Any other specific construction data (e.g., cooling requirements, external flushing requirements, etc.).
- m. Estimated Shut – off pressures to be reported in pump datasheet.
- n. For pumps in congealing service, pour point to be mentioned in pump datasheet.

- o. For pumps handling sludge / solid particles, details of solid particles such as max concentration of solid handled and max particle size diameter to be reported in pump datasheet.

6.2.4. VESSELS/ COLUMNS/ REACTORS/DRUMS

This section covers specifications for reactors, columns, drums (for process use within ISBL). It will contain the process design of the vessels including internals (distributor, outlet collector, unloading nozzle, etc.)

- a. Vessel name and tag number, Quantity, Diameter and height or length
- b. Sketches of Vessel/ Column/ Reactor/ Drum layouts showing dimensions, tentative elevations, location of nozzles and manways, internals such as trays, demisters, packed sections, catalyst sections, collector trays, Tray spacing, number of trays, Key tray numbers and locations, gravity or spray distributors, support grids, type of head, etc. Vessel diameter shall be expressed as ID for vessel shells and OD for vessel boots.
- c. Process design conditions (including Density of liquid at operating conditions.
- d. Mechanical design condition (internal and external if any) including recommendations, if any, on jacketing, stress relieving, insulation, surface finishing, etc. LICENSOR shall follow good engineering practice in evaluating system hydraulics and pressure relieving conditions (including considerations such as impact of vapour blow backs for high pressure vessel to low pressure vessel letdowns) and accordingly fix the mechanical design conditions. It shall be reasonably ensured that such design conditions will not require them to be revised upwards in the course of detailed engineering.
- e. Materials of construction and corrosion allowance of shell & internals, Insulation requirements. Cladding requirements, Recommendations for post weld heat treatment, if required for corrosion reason.
- f. Number, type and spacing of trays for towers.
- g. Number, type & height of packed beds.
- h. Elevation, size and service of nozzles.
- i. Process data sheets for trays/ packed bed sections.
- j. Details and design data of other internals like demisters, distributors, linings, etc.
- k. High, low and normal liquid levels in vessels and tower bottoms/ collector trays (including interface levels).
- l. Vapour-liquid traffic data for trays and packed internals, indicating fluid flowrates, operating conditions, fluid density, fluid viscosity, liquid surface tension, allowable pressure drop, vapour molecular weight, etc.
- m. For reactors: Mechanical design conditions and arrangement for reactor internals (temperature, pressure drops, loads) catalyst beds arrangement and arrangement drawings for thermocouples and wells in reactors, Catalyst regeneration conditions if applicable.
- n. For columns: Other specific inputs:
 - i. Additional sketches, as required to show locations, sizes or orientation for

- ii. particular column components especially for top tray, bottom tray and transition zones (sketches of distributors and redistributors):
- iii. Type of flow: single, double, 4-way cross flow
- iv. Typical arrangement of down-comer for top and bottom
- v. Typical arrangement of inlet/outlet weirs and notching, if required
- vi. Special tray features such as seal pans, draw-off pots when required
- o. For packed columns, sketches of support trays, distributors, redistributors are out of LICENSOR scope and shall be supplied by packing supplier.
- p. Separate tray design data sheets for each column section, which detail the following:
 - i. Type of tray (definition of valves, sieve, bubble-cap, or baffle tray)
 - ii. Reference column number
 - iii. Tray number as labeled on column process sketch
 - iv. Inside diameter
 - v. Normal tray spacing
 - vi. Material of construction type
 - vii. Operating temperature and pressure
 - viii. Number of passes
 - ix. Turn down and over-design requirements
 - x. At normal loading, the vapor and liquid loadings, vapor and liquid density, liquid viscosity, surface tension
 - xi. Allowable pressure drop
 - xii. Design maximum flooding factor
 - xiii. Foaming factor
 - xiv. Tray support details (if qualified sellers is mandatory for trays) Separate packing design data sheets for each column section, which detail the following:
 - xv. Type of packing
 - xvi. Reference column number
 - xvii. Bed number and estimated height
 - xviii. Inside diameter
 - xix. Material of construction of packing
 - xx. Operating temperature and pressure
 - xxi. Turn down and over-design requirements
 - xxii. At normal loading, the data for vapor and liquid loadings, vapor and liquid density, liquid viscosity, surface tension
 - xxiii. Allowable pressure drop

xxiv. Design maximum flooding factor

xxv. Foaming factor

6.2.5. HEATERS

- a. Fluid flow rates with breakup of vapor/ liquid/ steam/water/ non-condensable, density, viscosity, thermal conductivity, surface tension and vaporization curve correlating pressure, temperature, enthalpy and percent vaporized, Mol Wt (if vapour), specific heat, over capacity on flow and duty, turndown achievable.
- b. Operating temperature and pressure.
- c. Mechanical design conditions. LICENSOR shall follow good engineering practice in evaluating system hydraulics and accordingly fix the mechanical design conditions. It shall be reasonably ensured that such design conditions will not require to be revised upwards in the course of detailed engineering
- d. Allowable pressure drop. The same data would have been be used in unit hydraulics executed by the LICENSOR
- e. Materials of construction and corrosion allowance.
- f. Fouling factor or expected coke thickness.
- g. Type of heater, e.g., cabin type or vertical cylindrical, natural draft or forced draft, double fired or single fired, etc.
- h. Heat transfer duty/ absorbed heat for each section. Whether limitations such as fluid velocities, maximum skin temperatures, heat flux, etc., apply.
- i. Fuel data for fired heaters.
- j. Design requirements (e.g. number & size of passes, coil configuration, heat flux and/or velocity limitations, efficiency, excess air, NOx emission, maximum skin temperature, etc.)
- k. Details of burner(s) along with details of ignition equipment and flame scanning devices. Insulation details, including notes on recommend method of application and precautions, if any.
- l. Stack details including monitoring instruments.
- m. Burners will be designed with Fuel gas firing.
- n. Thermal efficiency of heater and strategies for improving efficiency towards a target of 90%. These shall be evaluated in the course of BDEP preparation and review, discussed with OWNER, and included as directional instructions for detailed engineering contractor.
- o. For heaters included in LICENSOR scope for thermal/ mechanical design, as per agreed scope of engineering services, the details shall be complete to the extent relevant and necessary as per industry practice and would include detailed evaluation of heater efficiency measures.
 - i. Conceptual Heater/ APH system P&ID's along with Logic shutdown and heater schematic sketch

- ii. In case LICENSOR requires special burners, Details of burner(s) along with details of ignition equipment and flame scanning devices shall be provided. Insulation details, including notes on recommended method of application and precautions, if any.
- p. For CO boilers and waste heat boilers, when envisaged within unit, a duty specification will be provided, A Process data sheet will be supplied with following information:
Service, Type when relevant, Operating Case identification, controlling case for design

6.2.6. COMPRESSORS/ TURBINES/ BLOWERS/ FANS

- a. Gas flow rates with pure component composition breakup, dry and wet molecular weights, range of molecular weights for machine specification, compressibility factor, CP/CV ratio, gas density, gas viscosity, etc.
- b. Operating temperature and pressure at inlet and outlet conditions.
- c. Minimum/ normal/ maximum flow rates.
- d. Turndown and turn up ratios.
- e. Mechanical design conditions. LICENSOR shall follow good engineering practice and typical vendor information in specifying these. It shall be reasonably ensured that such design conditions will not require to be revised upward in the course of detail engineering.
- f. Number of stages
- g. Number of operating & spare units.
- h. Materials of construction and corrosion allowance (casing and internals).
- i. Recommended type of main and spare machine and machine drive including estimated shaft KW, assumed polytropic efficiency, head,
- j. Estimated utility consumptions,
- k. Recommended seal type,
- l. Dew Point of vapor at each stage
- m. Capacity control mechanism and ranges, where relevant. (Step control process requirements)
- n. Estimated settle out pressure
- o. Anti surge facilities.
- p. Operating conditions for start-up/ regeneration (if applicable).
- q. For centrifugal compressors, in case free draining of inlet and/or outlet lines of some or all stages is required away from the compressor, a note shall be provided as follows: "In case of bottom entry and/or bottom exit compressor, low pocket(s) with appropriate draining arrangements to closed blow down system shall be provided to limit the elevation of the compressor to reasonable levels."

6.2.7. FILTERS/STRAINERS

- a. Design flow rates, fluid density and viscosity, pour point and annotations towards presence of toxic, corrosive and erosive materials. Adequate particle size distribution and % solids data shall be included for design of filters.
- b. Operating temperature and pressure, allowable system pressure drop, filtration efficiency, etc.
- c. Mechanical design conditions. LICENSOR shall follow good engineering practice and typical vendor information in specifying these. It shall be reasonably ensured that such design conditions will not require to be revised upward in the course of detail engineering.
- d. Materials of construction and corrosion allowance of filter casing & internals and insulation / tracing requirements.
- e. Type of filter. In case of automatic backwash type filter, information on backwash system design like applicable backwash fluid (i.e., filtered fluid or external fluid), frequency of backwash, supply and return pressures of backwash fluid, size of backwash fluid supply/ return holdup & pumping arrangements etc.
- f. Noise limitations (if applicable).
- g. Mesh Size, filter feed particle distribution

6.2.8. MIXERS

- a. Process design conditions.
- b. Mechanical design conditions.
- c. Materials of construction.
- d. Type & extent of mixing action.
- e. Type of mixer and driver (if applicable).
- f. Power consumption (if applicable).
- g. Noise limitations.

6.2.9. MISCELLANEOUSEQUIPMENT

The duty specifications/ characteristics for miscellaneous equipment (chemical injection system, vacuum system, ejector, educator, desuperheaters and flame arrestor) shall be provided. This shall also include process performance specifications, fluid properties as relevant, mechanical design conditions, materials of construction and corrosion allowance, power consumption (if applicable), noise limitations (if applicable), etc. LICENSOR shall follow good engineering practice and typical vendor information in specifying these.

Datasheets for Chemical injection facilities (data sheet of vessels, pumps, metering, unloading facility etc.) in detail shall be provided.

7.0 SAFETY, HEALTH & ENVIRONMENT

7.1 HAZARDOUSCHEMICALS

Physical and chemical properties of all hazardous chemicals and streams present in the unit shall be defined and provided in completeness. The applicable Material Safety Data Sheets (MSDS) shall be included.

7.2 SAFETY REQUIREMENTS

Design shall incorporate latest features of environment protection & occupational safety. It shall incorporate various safety features in line with international safety standards and design practices. These should include but are not limited to following provisions.

- a. Necessary interlocks and automation to enhance operational safety.
- b. Measures for handling of emergency shut-down and shut down valve required for emergency isolation/ inventory containment shall be evaluated and specified on the P&ID wherever required.
- c. Smart positioners for Emergency Shut Down (ESD) valves.
- d. In-built facilities for safeguarding the process system in any type of emergency/failure.
- e. Use of combustion and burner technology to achieve low levels of noxious components in the flue gases.
- f. Closed sampling systems.
- g. Audio visual alert devices, Safe positioning of control panels. Closed sampling system.
- h. Necessary interlocks with appropriate SIL ratings to enhance operational safety

In case LICENSOR has a specific requirement for their design, the following shall be provided by the LICENSOR.

- i. Special safety requirement such as Hydrogen/ H₂S/ Hydrocarbon leak detectors
- ii. Snuffing steam rings around leak prone flanges etc. to be indicated wherever necessary. The number required along with the location to be identified.
- iii. Guidelines for any specialized fire protection and gas detection system for protection of equipment and personnel shall be provided. A conceptual layout & design of fire-fighting system and personnel protective facilities to be provided by LICENSOR, showing recommended sensory instruments, protective apparatus etc.

P&ID furnished in the Process Package would incorporate preventive measures for the identified hazards based on HAZOP studies conducted by the LICENSOR. LICENSOR shall ensure that the design of the unit is safe for operation. However, during detailed engineering, the identified hazards will be analyzed, and preventive measures will be incorporated in the design to prevent the hazards. LICENSOR to include data on release rates, conditions etc. for hazardous release cases, so as to enable carrying out consequence analysis using Dispersion Model.

BDEP shall contain a description of the major potential hazards and safety system employed to control those potential hazards and sufficient information for HAZID.

7.3 PLANT WASTE EFFLUENTS

All unit waste effluents and by-products (gaseous, liquid and solid) produced continuously or intermittently shall be identified and estimated quantity and quality shall be described (physical and chemical characteristics in format by OWNER). For intermittent users, frequency with quantity shall be specified. Recommended treatment/ disposal methodologies shall be given. An estimate of emissions, leaks and losses of chemical compounds shall be provided.

7.4 FLARE LOAD SUMMARY

For gaseous effluents connected to flare, a summary of flare loads shall be provided which will summarize the unit flare load for all relevant cases such as cooling water failure, general power failure, fire case, blocked discharge, any operational failure etc. Loads like venting of Hydrogen and any other gases during start-ups and emergency depressurizations etc. are to be provided to enable design the flare network and stack accordingly.

LICENSORS to furnish Flare mitigation strategy for minimizing flare load from the unit as a part of BDEP without any extra implication to the OWNER. Flare mitigation will be carried out in the complex with agreed mitigation philosophy. LICENSOR will provide unmitigated as well as mitigated loads for PSVs of the mitigated services for both liquid and vapor. LICENSOR to also provide necessary input in case additional flare mitigation are agreed mutually. The flare mitigation strategy will be applicable for both vapour as well as liquid Loads.

8.0 PIPING & INSTRUMENTATION DIAGRAMS

8.1 PIPING & INSTRUMENTATION DIAGRAMS

Piping and Instrumentation Diagrams (P&IDs) of the unit shall be provided. The purpose of P&IDs is to allocate, identify and specify all piping items and instruments in the unit, consistent with the process flow scheme on the PFDs. The P&IDs shall include all process lines, utility lines to individual process consumers, all start-up/shut down lines, instrumentation for control, monitoring and interlocks.

P&IDs, equipment numbering and equipment naming, instrument and line numbering philosophies and symbols shall be as per OWNER's system which shall be provided at the time of Design Basis finalization and shall form part of the Project.

LICENSOR will provide P&IDs as per agreed format during Kick Off Meeting.

The following information, as a minimum, shall be included in the P&IDs by LICENSOR:

8.1.1. PIPING

- a. All process lines required for all operating modes of the unit including normal operation and abnormal conditions such as start-up (inert feed), shutdown, flushing and regeneration, if applicable. Lines traversing between P&IDs as well as lines at unit battery limits will bear flagged connecting arrow-boxes.
- b. All utility lines with line number, size, piping class and insulation type required to individual process consumers. It stands clarified that a cooling water line to an exchanger such as product cooler is a process service and will have to be shown whereas cooling water line to a pump casing cooling is a non-process service and will not be shown. Also, utility distribution P&ID, showing unit utility headers and connections as per equipment layout, is excluded from LICENSOR's scope.
- c. Line size, Line number & piping class designation and insulation types for all process and utility lines. Line numbering philosophy shall be as per OWNER.
- d. Separate line numbers to be provided for individual pump suction and discharge lines and lines connecting number of shells of heat exchangers as applicable. For air cooler bundle inlet and outlet, separate line number to be adopted with appropriate spec breaks

(if required). The detailing of line numbering philosophy will be worked out during KOM in detail.

- e. Special piping items, like valves, spool pieces, spectacle blinds, process drains, vents, etc. will all be indicated. OWNER shall furnish his own standard details for selected LICENSOR to review and follow as agreed upon.
- f. Pressure relief valve inlet and outlet piping sizes (even if preliminary) and annotations towards location relative to connected equipment.
- g. Insulation, heat tracing (steam or electrical) and jacketing wherever required for process reasons.
- h. Requirements for sampling to be indicated. (Closed Sampling System to be provided)
- i. Special arrangements like relative elevation differences of lines, sloping of lines, hot or cold flushing, purge/blanketing, minimum distance requirements, etc. shall be clearly identified wherever relevant.
- j. Two phase line to be clearly identified with a note specifying appropriate supporting requirements for the same.
- k. Lines for alternate destination, off-spec (to be reviewed and approved by LICENSEE)
- l. Equipment by-pass lines for alternate operation (to be reviewed and approved by OWNER as well as LICENSOR)
- m. Spec breaks, insulation break for process lines
- n. Requirement for flushing oil injection on lines handling high pour point fluid
- o. Details of injection
- p. Valving: Air failure position of control and on/off valves, TSO requirements for on/off valves or control valves (when safety action is required, on/off valve will be installed as a standard/no solenoid on control valves), LO/LC requirements (key required for valve manipulation will be preferred to CSO/CSC, seal that can be removed on field for manipulation. To be confirmed during PIDs review), Check valves required on process lines, Check valves required on utilities lines (excluding utilities Piping Network), Control valve bypass, Hand wheel, Mechanical or key interlocks, Limit switches, Actuator type pneumatic/electric (As a standard, all on /off valves are specified with pneumatic actuators)
- q. Fittings: Spectacle blinds on lines used only for Start-up and Shutdown, Spectacle blinds required for positive isolation between two process fluids, spectacle/ spacer blinds for equipment isolation for positive isolation/ maintenance, Requirement for flushing oil injection on lines handling high pour point fluid, Details of injection.
- r. Special valve trim in case required.
- s. All the details indicated in the legend P&ID or elsewhere in the P&ID shall be cross referenced at relevant location as part of P&ID.
- t. Special piping items (Special Valves, low pressure drop check valve, injection quills etc.) shall be provided with a tag number and indicated in the P&ID. Datasheet for the same shall be provided.

- u. Single interface P&ID indicating all incoming and outgoing lines from the unit along with their battery limit isolation valve assemblies.
- v. IBR requirements as applicable to piping and instrumentation will be followed in the P&IDs. IBR requirements will be informed to LICENSOR as part of BEDB Part B during the Kick-Off Meeting.
- w. Interface P&IDs showing all lines (process and utility) entering or leaving the unit along with their battery limit instruments and isolation arrangements shall be included in the BDEP.

8.1.2. INSTRUMENTATION

- a. All instruments with their tag numbers for all operating modes of the unit including start-up, shutdown and emergency situations. Signals traversing between P&IDs as well as at battery limits will bear flagged connecting arrow-boxes.
- b. All instruments are required from a process standpoint on utility lines to individual process consumers. Definition of a process service is as defined above for piping.
- c. Instrument number, instrument designation as per ISA, insulation/ tracing requirements for all instruments. Instrument numbering philosophy shall be as per OWNER's system. All instrument P&ID symbols shall follow ISA symbols.
- d. Control loops and instruments for proper and safe operation.
- e. Size and air failure position of control valves. Type of control valve manifold either in the P&ID itself or as a legend referring to a specific table of valve size vis-a-vis manifold valve sizes to be followed.
- f. All control valve sizes to be incorporated in the P&IDs along with the depiction of the required reducers and expanders.
- g. Clear identification of all hardware and software instruments both in field and in control room, philosophy of automated trips and start-ups, alarms, etc.
- h. Set pressure and recommended size of pressure relief valves.
- i. All PSV sizes to be incorporated in the P&IDs along with the inlet and outlet line sizing/ numbering and piping spec break wherever applicable by LICENSORS.
- j. OWNER's philosophy towards use of single tapping points for multiple instruments, permitted use of a transmitter signal for both monitoring and interlocking, etc. shall be adopted after review.
- k. Additional instrumentation for flare mitigation as agreed and instruments as required for operation as per OWNER's requirements to be incorporated with tagging and specification.
- l. Process switches shall be realized only through field transmitters.
- m. All instruments required for ensuring Process Performance Guarantee of LICENSORS shall be ensured by the LICENSOR in the P&IDs.
- n. In case locked open (LO) gate valves are provided on the inlet and/or outlet lines of safety valves, the same shall be arranged with their stems either in the horizontal or in the

vertically down position so that breakage of stem and falling of gate does not block the PSV discharge line. This is as per statutory requirements for the plant.

8.1.3. EQUIPMENT

The equipment on the P&IDs will show the tag number and service name, mechanical design pressure and temperature of all equipment (major as well as minor, normal as well as spare) along with the following data in line with the information provided on equipment data sheets:

- a. Columns: Diameter, height. All nozzles, Manholes, Drain, vent (connected on pipe by default), Utility connections (only nozzle and isolation valve), Steam out connections to columns (shall be hard piped and depicted accordingly on the P&IDs), Tracing/Steam coil, Columns major Internals (columns shall be shown on P&IDs in accordance with general arrangement of column Data sheet, except for trays. For trays show transition zones, draw off, top, bottom, feed and reflux trays and whenever required for instrument localization. Vortex breakers shall be shown. All internals such as trays, demisters, packed sections, collector trays, gravity or spray distributors, etc. shall be provided
- b. Vessels: Diameter, length/ height. All nozzles, Manholes, Drain, vent (connected on pipe by default), Utility connections (only nozzle and isolation valve), Steam out connections to columns (shall be hard piped and depicted accordingly on the P&IDs), Tracing/Steam coil, Drums internals including demisters baffles etc. (drums shall be shown on P&IDs accordance with general arrangement of drum Datasheet). Dryers and reactors major internals to be shown.
- c. Heat exchangers: Rated heat duty, type of equipment, etc. Number of shells with piping arrangement, line numbers, instrumentation details etc. (coldest shell is tagged as "Shell A". For utilities, cooled fluids will be shown from top to bottom and heated fluid from bottom to top. For process fluid, no specific recommendation. Stacking of shells where relevant. Line numbering for lines connecting two shells (if these are not stacked). Detail piping arrangement for exchanger shells.
- d. Compressors: Type, rated volumetric flow rate, differential pressure/ head, Strainers, Motor/Steam/Gas turbine (Turbines used for rotating machine drive only will be identified as per the numbering philosophy set out in the PROJECT SPECIFICATION), Power recovery turbine as applicable, Nitrogen and Flare connection lines (process purpose).
- e. Pumps: Type, rated volumetric flow rate, differential pressure/ head, Strainers, Steam turbine (Turbines used for rotating machine drive only will be identified as per the numbering philosophy set out in the PROJECT SPECIFICATION), Power recovery turbine.
- f. Air Coolers: Complete information related to this on the P&IDs like: Number of air cooler bundles, Inlet and outlet line numbers from each bundle and the complete detailed piping arrangement, Instrumentation and control system, line numbers, instrumentation details etc. as per agreed philosophy: Variable Speed Driver, Variable Pitch (if required for process reasons), Vibration switches on each fan to trip respective fan on sensing high vibration.
- g. Fired Heaters: Typical representation, Number of heaters passes, with dedicated line numbers and instrumentation for common feed/transfer line as well as for each pass,

Neutralization nozzles (if applicable), Instrumentation and control system on process side (including skin Thermocouple). Any additional instrument in flue gas side as applicable.

- h. Filters: type, etc. additional instruments and safety valves.
- i. Miscellaneous:
 - i. Vendor Packages (shown as an empty box) with the connection of the
 - ii. minimum instrumentation and control required from process point of view.
 - iii. Desuperheater's representation.
 - iv. Silencers representation (shown only after ejectors)
 - v. Flame arrestors representation
 - vi. Static mixer representation
- j. Type and number of static and rotating equipment with driver type.
- k. Position and elevation requirements. For vessels with connected pumps, this elevation will correspond to equipment elevation in equipment layout after ensuring that pump NPSHA requirements have been met.
- l. Insulation/ tracing requirements.
- m. All equipment required in the unit, major as well as minor, normal as well as spare, shall be shown in the P&IDs.

8.2 PROCESS CAUSE AND EFFECT DIAGRAM

A Process Cause and Effect Diagram (PC&ED) shall be provided. The PC&ED gives an overview of the process related safeguarding controls ("trips" or "shutdowns") as described in the Process Control Philosophy and shown on the P&IDs.

The PC&ED shows causes (e.g.: high pressure protection by a switch) and their effects (e.g.: plant depressurizing, compressor trip) in the form of a matrix-diagram.

The PC&ED forms the basis for the detailed design of the safeguarding system and has to be considered as an integral part of the P&IDs.

8.3 INTERLOCK DESCRIPTION AND LOGIC DESCRIPTIONS

Interlock descriptions and logic descriptions shall be provided. Logic description shall indicate the emergency shutdown causes and the effects on the emergency shutdown valves as installed in the unit. Control algorithms of special loops, if any, used for operability/ optimization will be provided with explanation.

SIL identification shall be performed by consultant and loop/ circuit shall be identified for implementation by consultant.

8.4 PLANT DESIGN

8.4.1. PLOT PLAN

A conceptual plot plan for the unit with major dimensions showing all process equipment, accessories and battery limit shall be provided. The plot plan shall meet all stipulations of Oil Industry Safety Directorate (OISD 118). This drawing shall include the following:

- a. Location of equipment based on construction/ operating/ maintenance requirements and on safety aspects taking into consideration OWNER's broad requirement towards inter equipment distances and other applicable safety norms, codes, standards/ guidelines.
- b. Plant limits and overall dimensions.
- c. Access roads and surrounding roads.
- d. Main pipe racks and main structures.
- e. Plant North, actual North and predominant wind direction data furnished by OWNER.

Bidder's hydraulic calculations have to necessarily correspond to this indicative equipment layout and Bidder will ensure that so long as the indicative layout is unchanged, all hydraulic calculation data (pump head, line sizes, control valve operating pressure drops, etc.) provided by the Bidder in BDEP will hold good.

Bidder shall review and approve the final unit plot plan developed during detailed engineering.

9.0 PIPING SPECIFICATIONS

LICENSOR shall employ OWNER's Piping Material Specification (PMS) to standardize the design which would be provided to LICENSOR at the outset of the project. LICENSOR is obliged to provide his observations on OWNER's PMS and deviations required therein to meet LICENSOR's requirement prior to the stage of BDEP finalization. Equivalent Line Class will be jointly developed by OWNER and LICENSOR. Requirement of special services, NACE, PWHT, wet H₂S, Hydrogen service to be included in the PMS suitably.

P&ID's, line list and all other documents shall indicate OWNER's PMS. Piping specifications shall be provided based on fluid properties, corrosion allowance, operating and design pressures/ temperature. Specifications will also indicate nominal size, rating and wall thickness (schedule), valving and welding requirements, gasket types, flange facings and reinforcing requirements, if any. Requirement of special valve (if there is any) must be shown on PID and tagged suitably. This section shall also contain specifications for relief valves, ejectors, strainers and where required, special check valves, expansion joints etc.

9.1 LINE SCHEDULE

Line Schedules shall list all lines shown in the P&IDs and include line number, service, description, line size, piping class designation, starting and ending points, operating/

design conditions, upset condition temperature and pressure (when exceeding mechanical design conditions), steam out requirement (if applicable) and flow regime, velocity, pressure drop, material specification, tracing and insulation designation and details of any special piping items. Line Schedule to identify two phase flow lines and provide their required data like vapour flow rate and density, liquid flow rate and density etc. Two phase flow needs to be specifically identified by LICENSOR in line schedule.

9.2 INSULATION SPECIFICATIONS

Specifications for the various insulation types covering the requirements of all equipment and piping shall be provided.

10.0 ELECTRICAL AND INSTRUMENTATION**10.1 ELECTRICAL**

A summary of all process electrical consumers and their estimated normal and maximum power consumptions shall be provided. Consumers requiring emergency power shall be indicated and specification for emergency power shall also be furnished.

10.2 INSTRUMENT DATASHEETS

10.2.1. Process data sheets for all instruments covering all instrument loops (open or close and field or control room) indicating main components, operating conditions, special conditions, etc. shall be provided. Instrument list with process data (tag no., min. value, low and high alarm limits,) shall also be supplied in the package.

Instrumentation and controls specifications for in line instruments (such as flow instruments, relief valves and control valves, etc., on stream analyzers, alarm and shutdown systems) shown on the P&IDs shall be provided. Information in supplied instruments process datasheets relates to following types of instruments:

- a. Flow
- b. Level
- c. Pressure
- d. Temperature
- e. Control Valves
- f. Safety Valves
- g. Analyzers
- h. Gas Detectors
- i. Miscellaneous (when applicable)

Instrument data sheets shall provide for the specification of service indicating normal, steady state, the applicable operating conditions and physical properties of process streams, mechanical design pressure and temperature.

All the above instrument datasheet {item a) to item i} shall specifically cover the steam out requirement, if applicable.

Datasheets and arrangement drawings shall be provided for thermocouples and thermowells in reactors.

For the specific types of instruments, the following minimum information shall be provided in the Instrument Data Sheet:

10.2.2. CONTROL VALVES

For control valves, information in supplied valve process data sheets shall contain:

- a. Tag number, location, flow rates (minimum, normal and maximum),
- b. Applicable flowing conditions with operating range, (minimum/normal/maximum)
- c. Properties at flowing conditions (density and viscosity for liquids, molecular weight and compressibility factor for gases, whether liquid is congealing,)

- d. Mechanical design conditions
- e. Pressure drop at minimum/normal/maximum flow
- f. Valve specific characteristics (Fail safe position, limit switches, tight shut-off, hand wheel and solenoid requirements).
- g. Fire-safe / fireproofing requirements.
- h. Applicable maximum differential pressure with valve closed
- i. Control valve size, mechanical limit stops (if applicable), spring action, etc.
- j. Leakage Classifications

10.2.3. SHUTDOWN VALVES

Tag number, location, operating & mechanical design conditions, air failure position, mechanical limit stops (if applicable), action, quick opening/closing requirement (if applicable), leakage class, limit switch requirement (if applicable as per OWNER/ LICENSOR's philosophy), requirement of smart positioners (if applicable) etc. Partial Stroke test (PST) functions, fire-safe/fireproofing requirement, SIL requirements if any, Valve Open/Close time if critically applicable etc. shall be considered for critical / identified shut down valves.

10.2.4. SAFETY/ RELIEF VALVES

Tag number, location, sizing flow rates, set pressure, operating & relieving conditions, allowable over pressure, density and viscosity and other characteristics (such as congealing nature etc.), molecular weight and compressibility factor for gases, all other applicable physical properties of relieving streams are to be provided in each emergency/ Relieving cases (including fire case) as applicable for the service. In the case of flashing liquid discharges, outlet condition liquid and vapour flows and physical properties will be provided for the project specified superimposed back pressure.

10.2.5. ANALYZERS

Tag number, location, type of analysers, composition of fluid to be analyzed, physical properties to be analyzed, ranges of measurement, density and viscosity for liquids, molecular weight and compressibility factor for gases, operating & mechanical design conditions, alarm set point, control set point, etc. Composition of the fluid shall be indicated in terms of mol% for vapours and wt% for liquids. Type and details of on-line analysers and their desired range of measurement during normal operation, catalyst regeneration, start-up etc. should be clearly mentioned.

10.2.6. TEMPERATURE AND PRESSURE INSTRUMENTS

Tag number, location, ranges, fluid properties data, operating & mechanical design conditions, alarm set point, control set point, etc. as minimum. Data for performing wake frequency calculations like velocity, etc. shall be provided for all thermowells.

10.2.7. FLOW INSTRUMENTS

Tag number, location, flow rates (minimum, normal & maximum), allowable pressure drop, density & viscosity for liquids, Special properties (such as congealing nature etc.), molecular weight and compressibility factor for gases, operating & mechanical design conditions, alarm set point, control set point, recommendation for type of instrument, etc. as minimum.

10.2.8. LEVEL INSTRUMENTS

Tag number, location, upper and lower fluid density & viscosity, whether fluid is congealing, operating & mechanical design conditions, alarm set point, control set point, etc. as minimum. Type of instrument and dielectric constant for radar type instrument shall be provided.

10.2.9. Alarms and shutdowns:

Prepare a preliminary alarms and shutdowns summary of general instrumentation with set points for alarm trips and alarms shown on P&IDs.

10.2.10. Analyzer Points:

List and types of sample connections to be used based on LICENSOR standard drawings and specifications.

10.2.11. Hand switches process data sheets: Provide list.

10.2.12. OTHER MISCELLANEOUS INSTRUMENTS

Tag number, location, process performance specifications and fluid properties as relevant including physical properties, operating & mechanical design conditions, alarm set point, control set point etc.

10.2.13. GENERAL INSTRUMENT SPECIFICATIONS

- a. Centralized control center shall have DCS to support HART and Foundation Field Bus (FF Bus) technology. Only open loop Instruments required for indication purpose shall be compatible with FF Bus technology with digital signal processing.
- b. Instrument Technical specification and Instrument data sheets shall be provided in BDEP according to HART/FF Bus technology. HART protocol instruments shall be used for ESD, Fast loops like compressor controls, Critical process loops in general for all closed loops, fixed type gas detectors and all type of analyzers.
- c. Hardware (Instruments) required for future APC implementation to be included as per LICENSOR's experience.
- d. Functional Schematics for Complex schemes with complete description and write-up shall be provided.
- e. Recommended vendor list for critical / special instrument like analysers. Critical control valves, special temperature elements shall be provided by the licensor.

11.0 SUPERVISORY OPERATING MANUAL

The supervisory manual will refer to process description and shall contain the following as a minimum:

- a. Processing objective of plant along with brief details of the project/ Unit like capacity, Feed/ product properties etc. as a minimum
- b. Process description along with process chemistry and kinetics
- c. Advanced technical features of the process
- d. Impact of variation in feed characteristics
- e. Operating variables and their effect on unit operation

- f. General Equipment operating procedures along with Equipment list with broad specifications
- g. Description of instrumentation, interlocks and permissive, control narratives
- h. Procedure for preparation of start-up (pre-commissioning and commissioning)
- i. Procedures/ operating instructions for normal operation, start-up, short-term
- j. shutdown, planned long-term shutdown and emergencies
- k. Troubleshooting in various scenarios
- l. Catalyst loading/ Unloading, handling and regeneration procedures if applicable
- m. Special procedures as applicable to heaters (e.g.: decoking), reactors, etc.
- n. Emergency & safety information
- o. Description of normal operating practices along with Normal operating parameters
- p. Operating flexibility
- q. Recommended laboratory test procedures, LICENSOR's own procedures if different from ASTM methods, frequency of analysis, parameters to be analyzed for feed streams, products & intermediates
- r. Safety data and other process safeguarding devices
- s. List of alarms and trips
- t. Startup diagrams
- u. Brief write up on Health, Safety and Environment safeguard

The manual shall be adequate for the OWNER or Detailed Engineering/ Procurement/ Construction contractor to develop a detailed operating manual subsequently. LICENSOR shall review the manual so developed.

12.0 SPECIAL EQUIPMENT

Datasheets/ specification for special equipment for operation of the unit shall be provided. Details of such equipment including process, instrument, mechanical, metallurgical, electrical, structural etc. aspects shall be provided completely to enable OWNER to obtain offers without requiring any further engineering by OWNER/ Detailed Engineering contractor and also take up erection/ execution subsequently. The list of such special equipment shall be finalized during Design Basis finalization.

13.0 BDEP FOR TERTIARY SEPARATION SYSTEM

LICENSOR to provide BDEP for Tertiary Separation System as per Minimum Scope given in Appendix-A of this document.

14.0 MECHANICAL DESIGN OF REACTOR AND REGENERATOR SECTION

LICENSOR to provide mechanical design of reactor regenerator section as per Scope given in **Appendix-B** of this document.

APPENDIX-A**MINIMUM SCOPE FOR TERTIARY SEPARATION SYSTEM BDEP**

LICENSOR on his own or through his associates / sub-LICENSORS shall provide the following minimum information and documents as a part of BDEP to facilitate residual design and detail engineering for the Tertiary Separation System (TSS).

- a. Process Description with Process Flow Diagram (PFDs)
- b. Piping and Instrument Diagram (P&IDs) (Fully Engineered)
- c. Material Balance (MBs)
- d. Utility Summary (Normal & Peak)
- e. Dimensioned Equipment Layout drawing of the Package - Plan and elevations showing all major components of the system
- f. Project specifications and Process Data Sheets, for the following (good for engineering) **
 - i. Vessels and Reactors
 - ii. Third stage separator
 - iii. Fourth stage separator
 - iv. Break Vessel (BV)
 - v. Catalyst Fines Hopper (CFH)
 - vi. Critical Flow Nozzle (CFN)
 - vii. ESP (if recommended)
 - viii. Instruments
 - ix. Electrical items
 - x. Piping & Valves
 - xi. Internals

Auxiliary equipment such as Filters, Accumulators, Dryers etc.

** So that individual components can be procured separately. Proprietary items should be supplied by LICENSOR.
- g. Package guarantee parameters like emission level at Battery Limit etc. (to be guaranteed by LICENSOR)
- h. Standard specifications
- i. Operation and analytical manual with operating variables
- j. Start-up procedures
- k. Preparation of start-up
- l. Startup operation procedures

- m. Normal shutdown and emergency procedures
- n. Performance testing procedures
- o. Safety recommendations
- p. Recommended Refractory Application and Dry out procedures
- q. Specialized and general maintenance procedures
- r. Special equipment
- s. Detailed Equipment list (good for engineering)
- t. Spare parts lists (only for critical components)
- u. Any other information that may be necessary for the fabrication, installation, commissioning and operation of the facility and for the meeting of LICENSOR guarantees related to the same
- v. Mandatory Vendor list of the Package or components of the Package.

APPENDIX-B

Minimum Scope of Mechanical Design of Reactor Regenerator Section LICENSOR to provide mechanical design as per following for the Reactor Regenerator Package:

- a. Regenerator/Reactor/Stripper General Arrangement Elevation, Plan View & Details
- b. Reactor/ Regenerator Internals including---Combustion Rings/Other Rings, Distributor Etc. along with support details.
- c. Regenerator /Reactor/Stripper Nozzle detail
- d. Regenerated and Spent Catalyst Standpipe detail, Elevation, Plan View, Nozzles, Sparger Pipe detail & its support detail and Misc Details
- e. Reactor Riser & Wye Elevation, Nozzle details
- f. Design Data and Material Specifications
- g. Temperature Profile Diagrams for Upset conditions
- h. Refractory Specifications and Skin Temperature Profile
- i. Injector Detail, Steam Ring Details, Air Ring Details
- j. Specifications and details for Feed Nozzles, Slide valves and Electro Hydraulic Actuators, Cyclones and Expansion Joints, Spring Support assemblies.

Along with above, following specifications shall be given by the LICENSOR:

- i. Refractory Lined Pipe
- ii. Regenerator Combustion Air Rings
- iii. Induction Bends If Recommended
- iv. Surface Preparation, Supply and Installation Of Refractory Materials

ANNEXURE-IV

PROCESS GUARANTEES OF OPEN ART UNITS

General

- 1.0** This document defines Process Performance Guarantee, which CONSULTANT provides for the following open art units:

- a. Revamp for Sour Water Stripper Unit
- b. New Amine Treatment Unit

1.2 Amine Treatment Unit

Amine Treatment Unit shall meet the following parameters:

Sl No	Parameters / Specifications	Unit of Measurement	Value
1	Unit thruput	WT%	100 of design thruput
2	Acid gas content in Lean Amine	Mol	0.015 KMol of H ₂ S / KMol of MDEA (max)

1.3 Sour Water Stripper Unit

Sour Water Stripper Unit shall meet the following parameters:

Sl No	Parameters / Specifications	Unit of Measurement	Value
1	Unit thruput	WT%	100 of design thruput
2	H ₂ S content in Stripped water	ppmw	50
3	NH ₃ content in Stripped water	Ppmwt	50

- 2.0** For establishing the above Process Performance Guarantee in coordination with PMC/ OWNER, test runs will be conducted with feed stocks having substantially similar characteristics as those of design feed stock within the period of 180 days from commissioning.
- 2.1** Prior to a test run, detailed methods to be used in the test run shall be agreed upon in writing between CONSULTANT and OWNER. These methods shall be in accordance with normal practice and will include methods for measuring various process streams by calibrated measuring devices, methods for calibrating such measuring devices, methods for sampling and analyzing process streams, as well as methods for evaluating the results of the measurements and analysis. Furthermore, acceptable tolerance for all results shall be specified.
- 2.2** The test run shall commence when the respective unit is operating under stable conditions and shall be conducted for a period of not less than 72 (seventy-two) consecutive hours or mutually agreed time period. Based on mutually agreed and jointly collected measurements during the test run, CONSULTANT and OWNER shall evaluate the results of the test run to confirm conformity with the Process Performance Guarantee.

- 2.3** The unit shall be deemed to have passed a successful test run, if during the test run, the unit has performed as guaranteed and the guarantees specified in this document have been successfully fulfilled.
- 2.4** If during a test run, the Unit fails to perform as guaranteed for reasons attributable to the CONSULTANT, as soon as possible the CONSULTANT shall investigate the reasons for such failure and suggest modifications to the UNIT or its operation as the CONSULTANT may deem necessary for enabling the UNIT to perform as guaranteed. CONSULTANT will perform corrective engineering and shall bear the entire expenditure related to this corrective engineering to achieve satisfactory results without any limit related to the corrective engineering, supplies and CONSULTANT services.
- 2.5** Consultant also shall pay and bear the cost deputing its personnel for witnessing and supervising modifications and repeat the test run.

ANNEXURE-V

List of project related documents required to be developed / Updated / Obtained by consultant

1. Project Overview
 - a. Summary of the Project
 - b. Overall Site Plans and Process Block Flow Diagrams
 - c. Basis of Design
 - d. Project Implementation Plan & Organization
 - e. Discipline Specific Plans
 - f. Schedule for Project Phase
 - g. Long Lead Equipment
 - h. Estimate Summary
 - i. Databases
2. Philosophies and Procedures
 - a. Project Management
 - b. Process Engineering
 - c. HSE and Design Safety
 - d. Construction
 - e. Commissioning
 - f. Procurement and Contracts
3. Specifications and Standards
 - a. Indices
 - b. Project Specifications
 - c. Standard Drawings and Documents
4. Common Drawings and Documents
 - a. Project Management
 - b. Procurement
 - c. Process
 - d. Commissioning
 - e. Fire Engineering
 - f. Environmental
 - g. Piping

- h. Civil, Structural and Buildings
- i. Rotating Equipment
- j. Vessels and Heat Exchangers
- k. Technology
- l. Packaged Equipment
- m. Electrical and Telecommunications
- n. Instrumentation
- o. SIL study and SIL calculations report
- p. Cybersecurity vulnerability, risk assessment report.
- q. Loss Prevention
- r. Construction
- s. Quality Assurance

5. Process Units

- a. Basis of Design
- b. Process Documents
- c. Unit Plot Plans
- d. Equipment List
- e. Process Flow Diagrams
- f. Piping and Instrument Drawings
- g. Process Datasheets
- h. Engineering Drawings and Datasheets
 - i. Civil, Structural, Architectural & Undergrounds
 - ii. Electrical
 - iii. Instrumentation
 - iv. Mechanical Datasheets
 - v. Equipment Requisitions
 - vi. Other Documents
- i. Estimating
- j. Procurement

CHAPTER-3

TIME SCHEDULE

1.0 The time schedule is as given below:

The contractual completion of the entire project facilities of PRFCCU and associated units of Bharat Petroleum Corporation Limited, Mumbai Refinery including Mechanical completion and commissioning is 47 (forty-seven) months from date of award of contract/LOA (Letter of Acceptance) to the consultant. PRFCCU and associated facilities shall be mechanically completed within 43 (forty-three) months from the date of issue of LOA/FOA or PO whichever is earlier to the consultant.

Commissioning of the units shall be completed within 4 (four) months from the date of Mechanical Completion.

Milestones of Delivery (“Milestones”)	TIME LIMIT
Review, Update, prepare and Finalize ENGINEERING DESIGN BASIS	Within 1 (one) Month from the date of LOA
P&ID Review for Licenses Units and Open Art Units at Consultant office / Owner Office	Within 2 (two) Months from the date of LOA
Hazop and SIL Review for Licenses Units and Open Art Units at Consultant office / Owner Office	Within 3 (three) Months from the date of LOA
Preparation and floating tender for PRFCCU RR Package	Within 3 (three) Months from the date of LOA.
Review, Update, prepare and Finalize BDEP / FEED / PROCESS PACKAGE for Licensed Units	Within 4 (four) Months from the date of LOA
Review, Update, prepare and Finalize FEED / BDEP / PROCESS PACKAGE for Open Art Units	Within 4 (four) Months from the date of LOA
Review and Finalize Plot plan, Equipment layout for PRFCCU- PRU (Part) Block.	Within 5 (five) Months from the date of LOA
PRFCCU Civil Package 1: Preparation and floating tender for Civil, Underground and Structural Works	Within 5 (five) months from the date of LOA
Review, Update, Prepare and Finalize Plot plan, Equipment layout for ARU-Caustic Merox- PTU Block.	Within 6 (six) Months from the date of LOA.
Licensed & Open Art Units: Preparation and floating tenders for critical long lead items.	Within 6 (six) Months from the date of LOA.
Prepare and Finalize layout and sizing of Substations, Control Rooms.	Within 10 (ten) Months from the date of LOA.
P&ID Review for Utilities & Offsites at Consultant office / Owner Office	Within 10 Month from the date of LOA
Hazop and SIL Review for Utilities & Offsites at Consultant office / Owner Office	Within 12 Month from the date of LOA
Prepare and Finalize Plot plan, Equipment layout for Utilities & Offsites facilities	Within 12 (twelve) Months from the date of LOA.
Utilities & Offsites: Preparation and floating of tenders for critical long lead items	Within 13 (thirteen) Months from the date of LOA.

Licensed & Open Art Units: Preparation and floating of tenders for other than critical/LLI packages and balance packages including PACKAGE /Works contracts.	Progressively along with critical packages but not later than 17 (seventeen) months from the date of LOA.
Utilities & Offsites: Preparation and floating of tenders for other than critical/LLI packages and balance packages including PACKAGE /Works contracts.	Progressively along with critical packages but not later than 19 (nineteen) months from the date of LOA.
Completion of fabrication & erection of Major jobs of Reactor Regenerator (RR) Package contract and plot (Rest of RR Package area) clearance for commencement of Civil, UG & Structural Package 2.	Within 24 (twenty-four) Months from the date of Award of RR Package
Award recommendation of critical long lead items.	1.5 months from the date of opening technical bids for respective item (This time is excluding time taken by BPCL in intermittent approvals if any).
Award recommendation of other than critical/LLI packages and balance packages including PACKAGE/Works contracts	Within 1.5 months from the date of opening technical bids for respective item (This time is excluding time taken by BPCL in intermittent approvals if any)
Mechanical Completion of the Project Facilities	Within 43 (forty three) Months from the date of LOA.
Commissioning of the Project Facilities	Within 4 (four) months from Mechanical Completion.

- 1.1 The CONSULTANT shall submit a project time schedule post award of contract, indicating critical activities, their duration and expected completion date, meeting the overall project completion date.
- 1.2 Commencement of Work: CONSULTANT shall commence the Work from zero date, which shall be the date of issuance of LOA. A Kickoff meeting to be arranged within 2 weeks from the issuance of LOA. The effective date for the start of the EPCM services shall be the date of issue of LOA, to proceed with the EPCM activities of the project and shall thereafter use its reasonable required efforts and resources to perform its obligations pursuant to this Contract in accordance with the Time Schedule. CONSULTANT recognizes the importance to OWNER of the completion of the Work in accordance with the Time Schedule.
- 1.3 Work Program: CONSULTANT shall within 21 days after the effective date of Contract furnish to OWNER for approval a detailed Work Program showing how CONSULTANT proposes to perform the Work in accordance with the Time Schedule of Work (incorporating but not limited to all Milestones and Milestone Tasks to complete the work within the specified time).
- 1.4 Approval of Program: OWNER shall, within 21 days of receipt of such program, notify CONSULTANT in writing that the work program is approved with or without modification.
- 1.5 The OWNER and CONSULTANT shall thereafter settle such work program and such settled program signed on behalf of the OWNER & CONSULTANT shall constitute "Time Schedule of Work" for the purpose of the Contract.
- 1.6 Priority of Work: CONSULTANT shall give the Work the highest priority and no other work of CONSULTANT shall take precedence over the Work, nor shall CONSULTANT make any allocation of its resources which would have the effect of delaying the timely performance of the Work.
- 1.7 Maintenance of Schedule of Work: If CONSULTANT is not performing the Work at a rate which will maintain the Schedule of Work, CONSULTANT shall, at its expense and without entitlement to any additional compensation, cause CONSULTANT'S Personnel to work such overtime and shall furnish

such additional personnel and other resources & inputs/ materials as may be required to comply with the Schedule of Work.

- 1.8** Adjustments of Schedule of Work: Time Schedule of Work shall be adjusted only:
- 1.9** by an extension of time granted by the OWNER or
- 1.10** when the Parties otherwise agree in writing that the Time Schedule of Work should be extended or accelerated.
- 1.11** The time of completion of the project as specified in the contract is the essence. The time for performance/completion of contractors will be duly covered along with applicable liability clause in the contracts and Consultant shall maintain adequate follow-up/generation of documentation to monitor the Contractor's progress and assist OWNER in claiming the liability/damages as per the contracts. Note:
OWNER shall endeavor to place orders for all the award recommendations which were given by consultant within 30 days from the date of receipt and same is included/factored in overall time schedule.

CHAPTER-4

CONSULTANTS ORGANIZATIONAL STRUCTURE FOR THE PROJECT

PROJECT MANAGEMENT ORGANISATION

1. CONSULTANT to plan, initiate, guide, coordinate, supervise and control the entire Project implementation activities through a dedicated task force consisting of specialists and experts on various aspects of the Project such as process design, engineering, contracts, purchase, inspection, construction, commissioning etc. The task force will be headed by a dynamic and competent Project Manager/ Project in-charge with proven ability in managing such large projects. All coordination and communications for the Project will be carried out under the overall guidance and control of CONSULTANT's Project Manager /Project in-charge. CONSULTANT will develop coordination and communication procedures soon after its appointment, in consultation with OWNER (BPCL).
2. The CONSULTANT will act as an extension of OWNER, always keeping in view OWNER's interests and advising/ guiding OWNER on all important matters, to ensure that the Project is completed within cost, time and quality targets.
 - a. Mid-course changes are expensive and therefore, tendency for changes in the organizational structure must be resisted and should be implemented only after the approval by OWNER.
 - b. Consultant for the Project will form a Documentation Control Cell. This Cell shall be responsible for all incoming and outgoing technical documents related to the project. These documents will be compiled as per agreed procedures, kept updated to the latest revision and delivered to the designated agency (ies).
 - c. Management of Inputs is key to successful Project implementation. CONSULTANT's Project control and monitoring system will be based on management of inputs right at micro level. Computerized tracking system will be used to enable CONSULTANT's Project personnel to monitor timely availability of inputs at every stage from all agencies engaged in Project implementation.
 - d. The construction plan is to be backed-up by a procurement plan and an engineering plan, which should offer maximum flexibility. It is therefore imperative that attention is paid to the success of procurement and construction plan of Package and conventional modes, where flexibility for minimizing time is low. This requires that the Procurement I Tendering procedure adopted by the Package / conventional contracts should be time- wise efficient. Further, the short list of vendors / site work contractors developed by the CONSULTANT in consultation with OWNER should include only such vendors who have proven performance track records.
 - e. CONSULTANT should use a good Software package for material movement and contractors billing. Major Sub-contractors should be induced to set up their PCs in the construction Office so that the Contractors, CONSULTANT as well as OWNER can handle material movement and billing operation on PCs.
 - f. The material related activities are to be carried out on BPCL SAP system in line with the prevailing procedure/ practices of BPCL. In this regard, Consultant shall provide dedicated qualified manpower for the entire operation of the Project (at BPCL Office/ Site), the cost

towards the same is deemed to be included in the CONSULTANT's quoted Lumpsum prices. The job nature shall be of assistance in materials codification, creation of Purchase requisition in SAP, creating Purchase orders, receiving the materials in SAP etc.

- g. Emphasis would be placed on mechanizing construction activities like automatic welding and automatic shot blasting etc. as much as possible. Therefore, the tenders/ contracts should specify such requirements.
3. CONSULTANT shall establish (if not already existing) a suitable communication system for electronic transfer of data & drawings among the Licensors, Process Designers, OWNER, Consultant and major Vendors/ Contractors for faster approval of drawings and decision-making.
- a. Project Consultant shall provide office space & related office infrastructure facilities, like furniture, computer, telephone, internet connectivity etc. for OWNER's team (facilities for maximum 2 persons) at CONSULTANT's Home/ Engineering Office and Site Office, the cost towards the same is deemed to be included in CONSULTANT's quoted Lumpsum prices. The facilities to be provided shall not include meals/refreshments and ISD calling.
 - b. Consultant shall provide list of Specialized Software Packages to be used for Project activities like Planning, Monitoring, Execution, Stores Management, Document Management etc. List to be submitted along with the bid.

Following is minimum expected:

- i. Primavera Package
 - ii. Spool Management Software
 - iii. Stores Management Software
 - iv. Procurement & Warehouse package
4. CONSULTANT shall establish proper system for documentation for the entire project (including Licensor, Package, Conventional, EPCM etc.)
5. CONSULTANT shall also note the following points:
- a. Project Manager in head office shall be responsible for the overall project activities of the Project including Design, Engineering, Procurement, and Construction & Commissioning of all facilities envisaged under the Project. Adequate skilled and experienced manpower to be deployed by CONSULTANT at head office, at site and also for other services such as Inspection, Commissioning etc.
6. CONSULTANT Head Office
- a. An exclusive Project Team of CONSULTANT shall be constituted for this project; the team shall be dedicated for this project and is to be continued till completion of project. This team shall be located at a single workstation for effective co-ordination between various disciplines.
 - b. The project is to be headed by an overall Project Manager/ Project in-charge. For an
 - c. effective co-ordination, the PROJECT shall be divided into subgroups such as: -
 - i. PRFCCU block consists of PRFCCU, PRU(Part)
 - ii. ARU, Caustic Merox, PTU and SWS
 - iii. UTILITIES & OFFSITES (OSBL Facilities)

- d. Each of the subgroups above shall be headed by individual Project leaders to enable effective co-ordination among all the disciplines and assisted by an adequate number of engineers to handle each functional area separately. Under Project leaders, there shall be sufficient number of supporting staff.
- e. Two numbers of dedicated Engineering s to be deployed by CONSULTANT to co- ordinate the Engineering Activities connected with the above subgroups.
- f. All the Project Managers and Engineers assigned for this project shall be available and responsible throughout the tenure of the project.

7. CONSULTANT Site Office at Mumbai Refinery

- a. A Resident Construction Manager (RCM) shall head the Consultant's project team at site. During evening, night shifts and holidays work, a minimum of 1 engineer from each discipline is required per plant per shift is to be deployed depending upon the type of work to be executed at site.
- b. RCM will be assisted by Deputy RCMs/Area-in -charge responsible for Quality Assurance/Inspection, Electrical, Mechanical, Instrumentation, Civil, safety etc.
- c. Area-in-charge/Deputy RCM shall be assisted by a team of engineers, responsible for Quality Assurance/Inspection, Electrical, Mechanical, Instrumentation, Civil, Piping, safety etc. The engineers' team (as mentioned in Deployment Chart) shall support each Area-in-charge in day today activities of the project.
- d. Commissioning team shall be headed Project leader (minimum). For Commissioning the Project, a minimum of 1 engineer per shift shall be deployed. Also, Electrical / Instrumentation engineers are to be available round the clock. The same shall also be ensured from package contractor.
- e. Minimum Manpower shall be deployed as per the deployment chart, mentioned in this chapter. In case excess manpower is required over and above the deployment chart, for the completion of the total scope in contractual completion period it shall be provided by the CONSUL TANT and cost towards the same shall be included in the Lumpsum charge.
- f. The office timing of the CONSULTANT site office should be in line with that followed by BPCL to ensure proper coordination and effectiveness.

8. Miscellaneous

- a. Prior to deployment by CONSULTANT of personnel with respect to any services covering construction supervision, start-up/ commissioning assistance at site and in the construction of the Project in relation to any services, CONSUL TANT shall submit detailed CVs of such persons proposed to be posted at site to OWNER for concurrence and approval. Authorized personnel from consultant shall concur with the CVs before sending them to OWNER for approval. Any concurrence/approval does not relieve CONSULTANT of his responsibilities and all the liabilities to this effect shall be of CONSULTANT.
- b. The specialized personnel proposed to be deputed at site shall be well qualified, highly experienced (as mentioned elsewhere in the tender document) and capable of handling their respective activities independently and shall meet all the requirements & responsibilities of the CONSULTANT collectively.

- c. CONSULTANT to furnish exact manpower and key personnel proposed to be positioned both at Head Office and Site for the Project. These details, along with their CVs shall be discussed and finalized with OWNER. And this organogram shall form a part of the Contract document.
- d. Should the performance of any of the CONSULTANT's personnel be found unsatisfactory by OWNER, the replacement of such personnel shall be carried out by CONSULTANT within 3 days of notification by OWNER.
- e. All technical people proposed to be posted on the site should have a minimum of 4 years of experience. No Contract engineers shall be permitted, and all personnel shall be in the direct payrolls of consultant. However, on exigencies, Contract engineers may be permitted (except for RCMs/Dy.RCMS/Area Coordinators) with prior approval from OWNER and they should have a minimum of 7 years' experience.
- f. Technical Personnel proposed by Bidder for deployment at site for performance of above services should be adequately qualified (minimum qualification - Graduate in Engineering) & have the experience of minimum 4 years in execution of projects in their respective field. Safety Officer/ Engineer shall have Degree in Engineering and Diploma in Industrial Safety and 4 years of experience in project construction site. The store officer shall be graduate and have minimum experience of 4 years in project construction site. Deputy RCM / Area Manager should be adequately qualified (minimum qualification - Graduate) & have experience of min. 10 years in execution of projects in their respective field. Engineer-in-Charge (RCM) shall be adequately qualified (minimum qualification -Graduate) and have the experience of more than 15 years in project execution with total experience, more than 25 years and should have handled & successfully completed one Project of similar magnitude in the refinery/ petrochemical sector.

Table: Minimum Site Manpower deployment chart

MONTHS	RESIDENT MANAGER(RCM)	CONSTRUCTION AREA I/C-COORDINATOR/ DEPUTY RCM	PLANNING	SAFETY OFFICER	CIVIL & STRUCTURAL	ELECTRICAL	INSTRUMENTATION	MECHANICAL	INSPECTION	PROCESS ENGG PRE-COMM / COMM	STORE / WH OFFICER	TOTAL TECHNICAL OFFICERS CONSTRUCTION MGMT SITE
1	1											1
2	1											1
3	1											1
4	1											1
5	1	3	2	2	2	1	1	2	1		1	16
6	1	3	2	2	2	1	1	2	1		1	16
7	1	3	2	3	2	2	2	2	1		1	19

8	1	3	2	3	3	2	2	2	2		2	22
9	1	3	2	3	3	2	2	2	2		2	22
10	1	3	2	4	3	3	3	3	2	1	2	27
11	1	4	2	4	3	3	3	3	2	1	2	28
12	1	4	3	4	4	3	3	3	3	1	2	31
13	1	4	3	4	4	4	4	3	3	1	2	33
14	1	4	3	4	4	4	4	3	3	1	2	33
15	1	4	3	5	4	4	4	3	3	1	2	34
16	1	5	3	5	4	4	4	3	3	1	3	36
17	1	5	4	5	4	4	4	3	4	1	3	38
18	1	5	4	5	4	4	4	4	4	1	3	39
19	1	5	4	5	5	4	4	4	4	1	3	40
20	1	5	4	5	5	4	4	5	4	1	3	41
21	1	6	4	5	5	5	5	5	4	1	4	45
22	1	6	4	6	6	5	5	5	4	1	4	47
23	1	6	4	6	6	5	5	6	5	1	4	49
24	1	6	4	6	6	5	5	6	5	1	3	48
25	1	6	4	6	7	5	5	6	5	2	4	51
26	1	7	4	7	7	5	5	7	5	2	4	54
27	1	7	4	7	7	5	5	7	6	2	4	55
28	1	7	4	7	7	6	6	7	6	2	5	58
29	1	7	4	7	7	6	6	8	6	3	5	60
30	1	8	4	7	8	6	6	8	6	3	5	62
31	1	8	4	8	8	6	6	8	6	3	5	63
32	1	8	4	8	8	7	7	8	7	3	5	66
33	1	8	4	8	8	7	7	8	7	3	6	67
34	1	8	4	9	8	7	7	9	7	4	6	70
35	1	8	4	9	9	7	7	9	7	4	6	71
36	1	8	4	9	9	8	8	10	7	4	6	74
37	1	8	4	9	9	8	8	10	8	4	6	75
38	1	8	4	9	9	8	8	11	8	4	6	76
39	1	8	4	10	9	8	8	11	8	5	6	78
40	1	8	4	10	8	8	8	12	8	5	6	78
41	1	8	4	10	8	8	8	12	8	5	6	78
42	1	8	4	10	8	8	8	13	8	5	6	79
43	1	8	4	10	8	9	9	13	8	5	6	81
44	1	8	4	10	8	9	9	14	8	5	6	82
45	1	8	4	10	8	9	9	15	8	5	6	83
46	1	8	4	10	8	9	9	15	8	5	6	83
47	1	8	4	10	8	9	9	15	8	5	6	83
TOTAL TECHNICAL OFFICERS FOR CONSTRUCTION MANAGEMENT SITE												2295

2.0 Notes:

1. Minimum manpower deployment schedule at the site is as above. The consultant has to augment additional necessary manpower (including other categories) for completing the scope in

contractual completion time. No additional payment will be done for the additional man month so deployed.

2. CONSULTANT to note that, all other manpower required to timely execute the project and to provide all mentioned services as per contract, should be included in the lumpsum quote.
3. Indicated manpower can be deployed in different shifts (Morning/Evening/Night Shifts) and also on Sundays/public holidays as per the requirement of project and as directed by OWNER.
4. The deployment chart will be adjusted to the date of appointment of EPCM to reflect exact date of commencing the contract.
5. Redeployment of above personnel to different months and between different categories (except RCM, Area – I/C Coordinator / Dr. RCM) can be done depending upon workload with mutual agreement between consultant and OWNER.
6. The consultant shall mobilize additional manpower for the SWS revamp jobs during shutdown / Turnaround and Other OSBLs Hooks with Connecting units during Shutdowns / Turnarounds. No additional payment will be done for the additional man month so deployed during the contractual period.
7. In the following scenario:

No man-month rate shall be considered for reimbursement within the Contractual Completion Date/Period, even if the deployed manpower exceeds the minimum requirement specified in the Manpower Deployment Chart above.

No deductions or penalties shall be applicable in the event the deployed manpower is less than the minimum specified in the Manpower Deployment Chart above provided that the actual completion of the project occurs within the Contractual Completion Date/Period.

No reimbursement and No deductions or penalties shall be applicable in the event the deployed manpower is less than the minimum specified in the Manpower Deployment Chart above provided that the actual completion of the project occurs within or beyond the Contractual Completion Date/Period. However, any additional manpower deployed beyond minimum manpower chart shall be re-imbursed provided the same is deployed beyond Contractual Completion Date/Period and the delay is not solely attributable to consultant.

8. Considering the size of project as well as the fact that existing Mumbai refinery is not having sufficient space for fabrication / lay down area, bleak possibility of laydown in close vicinity, a laydown area for fabrication is envisaged at a location approximately 40 to 60 km within / away from the site. This shall be read in conjunction with the Clause mentioned in Chapter 1 ODC. Since EPCM Consultant is responsible for schedule, quality and safety for site as well as fabrication facility, we are envisaging supervisory team to be stationed at fabrication / laydown facility (Perhaps, majority of bulk will be prefabricated at fabrication facility and EPCM will have to ensure compliance to contract). Consultant is required to deploy personnel for the above-mentioned sites (irrespective of distance) and also at the Piping Spool Fabrication Vendor / Packages Contractor's site (irrespective of distance). This will be Counted under this deployment chart on submission of relevant proof.
9. Covering construction supervision, start-up/ commissioning assistance at site and in the construction of the Project in relation to any services, CONSULTANT shall submit detailed CVs of such persons proposed to be posted at site to OWNER for concurrence and approval. Authorized personnel from consultant shall concur with the CVs before sending them to

OWNER for approval. Any concurrence/approval does not relieve CONSULTANT of his responsibilities and all the liabilities to this effect shall be of CONSULTANT.

10. The specialized personnel proposed to be deputed at site shall be well qualified, highly experienced (as mentioned elsewhere in the tender document) and capable of handling their respective activities independently and shall meet all the requirements & responsibilities of the CONSULTANT collectively.
11. Should the performance of any CONSULTANT's personnel be found unsatisfactory by OWNER, the replacement of such personnel shall be carried out by CONSULTANT within 7 days of notification by OWNER.
12. All technical persons proposed to be posted at site should have a minimum of 4 years of experience. No Contract engineers shall be permitted, and all personnel shall be in the direct payrolls of consultant. However, on exigencies, Contract engineers may be permitted (except for RCMs/ Dy. RCMs /Area I/C Coordinators) with prior approval from OWNER and they should have a minimum of 7 years' experience.
13. Technical Personnel proposed by Bidder for deployment at site for performance of above services should be adequately qualified (minimum qualification - Graduate in Engineering) & have the experience of minimum 4 years in execution of projects in their respective field. Safety Officer/ Engineer shall have Degree in Engineering and Diploma in Industrial Safety and 4 years of experience in project construction site. Stores officer shall be graduate and have minimum experience of 4 years in project construction site. Deputy RCM / Area Manager should be adequately qualified (minimum qualification -Graduate) & have experience of min. 10 years in execution of projects in their respective field. Engineer-in-Charge (RCM) shall be adequately qualified (minimum qualification -Graduate) and have the experience of more than 15 years in project execution with total experience, more than 25 years and should have handled & successfully completed one Project of similar magnitude in the refinery/ petrochemical sector.

3.0 DIVISION OF RESPONSIBILITIES (Indicative)

Table Activities under conventional mode of execution

Activity		Responsibility	
1.	Review, Update and Finalize Residual Process Design of Licensed Units	By Consultant	
2.	Process Design of Open Art Units and Offsite & Utilities, BDT		
(a)	Basic Process Design		
(b)	Residual Process Design		
(c)	Other Process Jobs		
(d)	HAZOP & SIL Study with Closure reports		
3.	Detailed Engineering, Interface with Existing facilities		
(a)	Mechanical		
(i)	Requirement of Design and Data sheets		
(ii)	Additional requirement of Design & Data		
(iii)	Piping		
(b)	Electrical		
(i)	General		
(ii)	Construction Power, Lighting & Communication		
(iii)	Project Power Distribution Schemes		
(iv)	Plant Electrical Equipment		
(v)	Standardization		
(vi)	Fire Protection		
(vii)	Emergency Power & HVAC		
(c)	Instrumentation		
(i)	General		
(ii)	Single DCS/PLC systems for entire Process units complex.		
(iii)	Single CCTV system, Enterprise Alaram Management system and Asset Management System for entire petc.hem complex.		
(iv)	Specifications and Datasheets for all Instrument items		
(v)	SIL study and SIL calculations, design, selection, implementation & proof testing		
(vi)	Cybersecurity vulnerability, risk assessment, system architecture design & implementation and third-party audit compliance report.		

	Activity	Responsibility	
(vii)	Analyzer System		
(viii)	F&G leak detection system and its PLC		
(d)	Civil		
(i)	General Civil Work		
(ii)	Civil & Structural including adequacy of existing Pipe Rack for the Piping Work		
(e)	Drawing Categorization		
(f)	Electronic Communication System		
4.	Detailed Design & Drawing approval including contractor's or Package Design & Drawing Review		
5.	Contracts		
(a)	Pre-qualification of Bidders		
(b)	Bid Preparation		
(c)	Evaluation & Award recommendation of jobs	By Consultant	
(d)	Award of jobs		By BPCL
(e)	Jobs after Award of contracts	By Consultant	
6.	Procurement Services	By Consultant	
(a)	General		
(b)	Vendor list		
(c)	Preparation Purchase Requisition, Floating the enquiry, Receipt of Bids, Preparing TQ/CQ, Clarification of CQ/PQ as per approved BPCL approved procedure.		
(d)	Price Bid opening, Price evaluation, Recommendation to OWNER for PO Placing.		
(e)	Award of job		By BPCL
(f)	Issuance of detailed purchase order		

	Activity	Responsibility	
(g)	Procurement Inspection of selected equipment	By Consultant	
(h)	Miscellaneous Procurement Activities		
(I)	Assistance in SAP Codification & PR/PO Creation, materials receipt etc.		
(j)	Follow up & Co-ordination including expediting of Material Delivery		
(k)	Follow up with Transporter for Material Delivery		
7.	Stores Management	By Consultant	
(a)	Receipt of the materials at site, checking as per PO conditions like quantity, certificates follow up with Vendor's for incomplete documents etc.		
(b)	Stacking properly with codes in the stores.		
(c)	Issue of materials as per requirement to contractors, and taking back left over/ surplus materials after the jobs over as per procedure including bought out items of		
(d)	Reconciling the materials		
(e)	Handing over the stores to OWNER		
8.	Project Management	By Consultant	
(a)	Planning & Control		
(b)	Development of Project procedures		
(c)	Project Quality assurance		
(d)	Monitoring co-ordination & supervision of contractors, measurement of work by contractors		
(e)	Project cost control including certification of contractors bills for payment by OWNER		
9.	Construction Management	By Consultant	
(a)	Construction planning & procedures		
(b)	Construction scheduling and monitoring		
(c)	Construction Quality Assurance		
(d)	Construction Inspection		
(e)	Material Control & Warehouse Management		
(f)	Spare Parts Management		
(g)	Reconciliation of materials and handing over of project surplus materials to BPCL group		

	Activity	Responsibility	
10	Assistance in Pre-commissioning / Commissioning & Performance Test run		
(a)	General		
(b)	Pre-commissioning & Commissioning		
(c)	Performance Test Runs		
11	Assistance in project closure activities		
(a)	Closure of contracts		
(b)	Financial closure of the contract		By BPCL

Table: Division of responsibility for major activities for PACKAGE jobs

	Activity	Responsibility	
1.	Review, Update and Finalize the Process Design of Licensed Units	By Consultant	
2.	Residual Process Design	By Consultant	
3.	Review, Update, Finalize and Development of Engineering Design Basis	By Consultant	
4.	Review, update and Finalize the FEED of Process Units and Offsite & Utilities, BDT	By Consultant	
(a)	Mechanical	By Consultant	
(i)	Requirement of Design and Data sheets		
(ii)	Additional requirement of Design & Data		
(iii)	Piping		
(b)	Electrical	By Consultant	
(i)	General		
(ii)	Construction Power, Lighting & Communication		
(iii)	Project Power Distribution Schemes		
(iv)	Plant Electrical Equipment		
(v)	Standardization		
(vi)	Fire Protection		

(c)	Instrumentation	By Consultant	
(i)	General		
(ii)	DCS/PLC systems for utility & offsite area		
(iii)	Specifications and Datasheets for all Instrument items		
(iv)	F&G system		
(v)	Analyzer packages		
(d)	Civil	By Consultant	
(i)	General Civil Work		
(ii)	Civil & Structural		
(e)	Drawing Categorization	By Consultant	
(f)	Electronic Communication System	By Consultant	
5	PACKAGE Work	By Consultant	
(a)	Pre-qualification of Bidders		
(b)	PACKAGE Bid Preparation		
(c)	Evaluation and recommendation for Award of jobs		
(d)	Award of jobs		By BPCL
(e)	Jobs after Award of contracts	By Consultant	
6	Procurement Services including procurement of identified items	By Consultant	
(a)	General		
(b)	Bid evaluation of major equipment (for PACKAGE jobs)		
(c)	Vendor list		
(d)	Procurement Inspection of selected equipment		
(e)	Miscellaneous Procurement Activities		

(f)	Follow up & Co-ordination including expediting		
7	Project Management	By Consultant	
(a)	Planning & Control		
(b)	Development of Project procedures		
(c)	Project Quality assurance	By Consultant	
(d)	Monitoring co-ordination & supervision of PACKAGE & other contractors	By Consultant	
(e)	Project cost control	By Consultant	
8.	Review of Design & Drawing approval	By Consultant	
9	Construction Management	By Consultant	
(a)	Construction planning & procedures	By Consultant	
(b)	Construction scheduling and monitoring	By Consultant	
(c)	Construction quality assurance	By Consultant	
(d)	Construction Inspection	By Consultant	
(e)	Material Control & Warehouse management	By Consultant	
(f)	Spare parts management	By Consultant	
(g)	Reconciliation of materials & handing over of project surplus materials to operation group	By Consultant	
10.	Assistance in Pre-commissioning, Commissioning & Performance Test Run	By Consultant	
(a)	General	By Consultant	
(b)	Pre-commissioning	By Consultant	

(c)	Commissioning	By Consultant	
(d)	Performance Test run	By Consultant	
11	Assistance in project closure activities		
(a)	Closure of contracts	By Consultant	
(b)	Financial closure of the contract		By BPCL

Note:

The above division tables are indicative. It shall be fine-tuned with the successful bidder by detailing further. Final responsibility matrix shall be prepared with mutual agreement post award with successful bidder.

CHAPTER-5

DIGITALIZATION SCOPE OF CONSULTANT AS APPLICABLE

1. With the proposed PRFCCU, BPCL recognizes the need for effectively leverage digital technology and other interventions to enhance collaboration, accuracy, and efficiency throughout the project lifecycle. By utilizing digital tools and processes, higher transparency in project execution, with minimal human intervention can be achieved. This will not only improve the overall efficiency of the project but also ensure a seamless transition to digitally enabled post-construction operations.
2. CONSULTANT should drive the following aspects execution via contractors and include these elements in the relevant contracts for contractors or drive them directly, where applicable. The CONSULTANT will be responsible for the integration of the solutions and must provide tracking mechanisms, adding a layer of dashboards.
3. CONSULTANT should ensure vendor/solution provider/ System integrator (SI) to comply with BPCL cyber security guidelines & provide certification.
4. CONSULTANT shall bear all expenses for the deployment of manpower services from their end for coordinating the related software and hardware licensing requirements for the execution of site work under its scope.
5. The Consultant's scope shall also ensure uploading all project-related documents, including Licensor, Vendor, and EPCM documents, into the BPCL Electronic Document Management System (EDMS). Consultant should ensure BPCL have always access to all project documents. It shall be the responsibility of the EPCM to ensure uploading of all documents as per BPCL's requirements, ensuring timely, accurate, and complete submission into the designated EDMS platform as instructed by BPCL.
6. CONSULTANT shall be and remain at all-time exclusively responsible to transfer all material, consumables, permits, software licenses, technical specification, approved designs, plans, drawings and/or other contract documents or howsoever otherwise required either for incorporation within the permanent works or in relative to the execution and performance of the work at any given point during the project. Necessary executable files, if any, will be required to be given on a Hard disk along with lifetime license (if applicable).
7. The selection between cloud-based and on-premises hosting for digital solutions shall be determined on a case-by-case basis, taking into consideration project requirements during execution. The final decision on the hosting solution will be made by BPCL after careful consideration of the project needs and cost implications.
8. CONSULTANT should submit a digital execution plan and a project controls execution plan, which will be jointly approved by BPCL. The digital execution plan shall include specifics on how uses cases will be implemented across all the contractors and sub-contractors. CONSULTANT may take help of a digital system integrator (SI) / Solution provided for the proposed implementation and integration.
9. CONSULTANT shall arrange to develop and install a suitable communication system for transfer of various documents / drawings electronically/ through E-mail/ internet between

CONSULTANT and OWNER. This clause pertains to establishing Communication and coordination procedure. The consultant shall use EDMS system and give access to BPCL.

10. For all use cases, a responsibility scope matrix for all project stake holders shall be prepared by consultant.

Control Tower

1. Establish an integrated project management system, serving as the central hub for all project-related information. Utilize advanced Digital Project management solutions to enable real-time monitoring and control of all project activities, including those being performed off-site. Please refer to Table 2 for the indicative list of KPIs. The final list that can be over and above will be finalized and jointly agreed by CONSULTANT and OWNER
2. Digital project management solutions should include an interactive dashboard (Power BI/ Tableau), along with data information management system that collect real-time information from multiple sources (e.g., Primavera for project schedule, ERP for contracts administration, EDMS system for documents submission status, BIM, etc.) and at least once a week from manual inputs.
3. Facilitate weekly discussion with project stakeholders through virtual meetings, updates, and shared digital platforms.
4. Establish clear protocols for error resolution, minimizing delays and cost implications. Leverage analytics for proactive issue resolution.
5. Integrate contractors into the Control Tower approach, ensuring alignment with project goals and timelines. Provide training and resources to contractors for seamless collaboration within the project framework.
6. Establish digital contract management and management of change system with real time updates and online tracking.
7. Establish a data repository, a common data environment and analytics layer necessary for storage, extracting, transforming and loading of data to and fro the other solutions and Control tower
8. CONSULTANT shall provide APIs (Application Programming interfaces) that can be utilized for the integration with existing solutions like IP21, ERP, work permit system and in house MOC.
9. Set up Key Performance Indicators (KPIs), as agreed upon, to monitor progress in real-time across all project phases (or update at least once a week for manual inputs). Regularly analyze and report on project performance through digital dashboards against established benchmarks.
10. Establish benchmarks in discussion with BPCL for issue resolution times and actively work to reduce the time taken to address challenges. Measure and report on the efficiency of issue resolution processes.
11. Digital project management tools will have to be within the options described in Table 1. The solutions should be compatible and need to integrate with CDE (common data environment) and control tower. Provide training sessions to ensure proficiency for the tools.

12. Establish a common data environment (CDE): The establishment of a common data environment (CDE) is crucial for the integration of different tools and solutions for the CONSULTANT. The CDE/ data lake shall serve as a common data repository for digital use cases such as EDMS, digital safety, digital quality, inventory management, transportation management, manpower and productivity management, and control tower. Additionally, the CDE shall act as an analytics layer for storage, extracting, transforming, and loading of data to and from other point solutions and the control tower. The CONSULTANT shall also establish the necessary architecture and middleware for interaction among point solutions.

Electronic Data Management System (EDMS)

1. The EDMS will act as the design management and review system. It will be a platform for storage and document retrieval and act as a data repository for 3D model viewing / Design /Document Reviews and team collaboration.
2. CONSULTANT has to ensure the successful execution of the EDMS system and integrate the EDMS and CDE into the project workflow for all stakeholders to minimize disruptions and streamline processes.
3. The CONSULTANT along with OWNER has to be define the workflows, documentation formats and approval levels, master tag list, and is responsible for the preparation of necessary specifications and lists required for EDMS.
4. The consultant will ensure the integration of their own system with the so deployed EDMS / digital CDE system.
5. The CONSULTANT will establish stringent document control protocols to manage revisions, approvals, and access permissions. Ensure traceability of changes and maintain an audit trail for accountability.
 - a. Ensure traceability of changes and maintain an audit trail for accountability.
 - b. Provide a suitable level of information and data quality assurance to avoid potential mistakes and errors.
 - c. Initiate formal system checks and define workflow upon receiving any information/ documentation.
 - d. Perform compliance and verification checks on all files, file names and any associated data (metadata). All non-compliant published information in part or whole shall be rejected.
 - e. Ensure configurable and system administrator controlled secure access rights according to the roles & responsibilities of the different stakeholders.
 - f. Automatic version control with a strong audit trail of all documents and files submitted, reviewed, and modified on the platform.
 - g. Archive all documents that have been approved or rejected during the project lifecycle.
6. CONSULTANT should ensure that the EDMS system provider does the following:
 - a. Data archiving upon the completion of the project lifecycle and exporting all data to BPCL's servers.

- b. Maintain data in view mode upon completion of the project lifecycle for BPCL to be able to export and print as needed.
 - c. Supporting end-to-end construction process flows across all teams and contractors and CONSULTANT.
 - d. Integration and seamless data interoperability with all solutions identified through APIs or connectors.
7. CONSULTANT to develop & Implement file management system that ensures access to documents, models, and data files to be downloaded or reviewed in compliance with secure access based on defined roles.
 8. The Consultant must ensure the use of the EDMS system established by the OWNER for the design reviews, uploading and validation of data and collaboration by self and other stakeholders (i.e. EPCMs, Package contractors, Vendors, Contractors). BPCL will provide the user license of the EDMS to the consultant and critical item vendors/contractors to upload the engineering design related data
 9. The consultant to ensure compatibility of files shared with industry standards and project-specific requirements.
 10. The consultant shall facilitate simultaneous access to project documents for all authorized team members to enable real-time collaboration. Implement and utilize features usage such as online commenting and annotation for effective communication.
 11. The consultant should ensure workflows for changes across scope, schedule and cost to be available across the project lifecycle including a defined process for escalation of changes, jointly agreed by CONSULTANT and OWNER.
 12. If required, the OWNER may place a user support expert or provide end user and system admin training to aid in deeper understanding of the software application, hence increasing the ability to derive better value.
 13. In case of training, the consultant to facilitate the hardware and infrastructure (venue, arrangements) for the training program by the EDMS vendor. Also, consultant to ensure to deploy a dedicated person to become an inhouse trainer and resolve minor issues w.r.t. software.
 14. The consultant should ensure the compatibility of solutions used and seamless integration with the final CDE (common data environment) and control tower solutions, decided at a later stage. Please refer to Table below for suggested tools. Details of compatible software with BPCL EDMS will be shared at a later stage with the successful bidder for individual application. The solutions should be compatible and need to integrate with CDE (common data environment) and control tower Consultant to ensure to work in the same software. Provide training sessions to ensure proficiency for the tools.
 15. In case of non-functionality of BPCL EDMS, consultants can engage their own EDMS after obtaining approval from BPCL. Consultant to provide view access of their EDMS and share the data seamlessly with control tower developed by CONSULTANT.

Real-time availability of yard-wise inventory & in-transit

1. The OWNER will provide access to their ERP system for running the procurement process. If implementing a different solution, CONSULTANT should ensure the procurement solution used by self or sub-contractor is integrated into BPCL's ERP (Enterprise Resource Planning) system and help create a comprehensive ecosystem that enhances efficiency, minimizes errors, and provides real-time insights into the progress and logistics.
2. Implement/ utilize OWNER's WMS (Warehouse Management System - SAP WM, Oracle WM, Blue Yonder or equivalent), implemented by CONSULTANT to:
 - a. Ensure barcodes are put on the equipment received inside the enclosed space by consultant for respective order of materials
 - b. efficiently manage and track inventory, material in and material out within warehouses, in yard and in designated fabrication/ workshops.
 - c. receiving, storing, and issuing materials, optimizing space, and reducing errors in manual data entry.
 - d. Streamline the order fulfillment process, ensuring the right materials are picked, packed, and delivered to the construction site promptly.
3. Convert critical equipment /LLI fabrication progress report provided by subcontractors monthly or more granularly into a digital format to be integrated with control tower. CONSULTANT shall prescribe a format to be followed by all stakeholders.
4. Utilize and integrate the TMS into operations (Transportation Management System – SAP TM, Oracle TM, Mercury Gate or equivalent), implemented by third party to:
 - a. Collate from other contractors and provide list of critical equipment to be tracked for transportation
 - b. Aid in providing real-time visibility into the movement of materials, allowing project managers to track shipments, monitor delivery times, and respond promptly to any deviations from the plan.
5. Regularly update and train staff on the use of these technologies to ensure effective utilization of (a) TMS (b) WMS, (c) RFID for Material Tracking and Access (d) IoT for Condition Monitoring and Environmental Monitoring.
6. Tools will have to be within the options described in Table. The solutions should be compatible and need to integrate with CDE (common data environment) and control tower. Provide training sessions to ensure proficiency for the tools.

Building Information Modelling

1. CONSULTANT to ensure the self and design contractors follow and make submissions in the authoring tools (instrumentation design, electrical design, P&ID drawings and 3D modelling) as specified by the OWNER.
2. CONSULTANT should collaborate with design and engineering teams to ensure a comprehensive integration of BIM across all project phases using 3D BIM, whilst also leveraging emerging technologies, onsite as well as off-site.

3. CONSULTANT is encouraged to implement and integrate BIM and associated digital solutions across all engineering disciplines and project management functions including but not limited to
 - a) Design authoring, Design review & Design coordination,
 - b) Scheduling & 4D BIM Planning
 - c) Estimating
 - d) Life Cycle Costing
 - e) Inspection
 - f) Field Monitoring of Construction.
4. The CONSULTANT shall ensure the following specifics for engineering design are met by the design contractors/EPCMs/Package contractors/Vendors:
 - a. The consultant has to work on the authoring tools (instrumentation design, electrical design, P&ID drawings and 3D modelling) as specified by the OWNER.
 - b. Consultant should use Intelligent P&ID with seamless integration into 3D Modelling database. All P&IDs shall be developed as Intelligent P&IDs with required database. These Intelligent P&IDs shall be linked with Editable 3D Model. It shall have facility to navigate from Intelligent P&ID to 3D Model and vice-versa.
 - c. Prepare the model of relevant facilities (including all OWNERs facilities) in the chosen integrated & intelligent 3D software solution using rule-based, data centric 3D Design software with equipment drawings, data sheets, intelligent P&ID correlated with intelligent 3D Model, BOQ, schematics and logic diagrams etc. attached to the respective equipment / systems in the aforesaid 3D model.
 - d. Consultant to integrate all its design data as per the defined authoring solution.
 - e. Consultant to consolidate all the data of Package Contractor / Conventional Contractors / Vendors as per the BPCL Information Handover Document.
 - f. Consultant to assist BPCL in preparation of SEED files for all the design tools specified
 - g. Transmittal & Submittal Workflows: Consultant to follow OWNER/CONSULTANT defined transmittal and submittal workflows for the data management, review mechanism and quality check. All the detailed workflows will be detailed out by BPCL as per Information Handover Document.
 - h. Standard project naming convention for 3D Modelling will be provided to successful bidder.
 - i. The complete material specifications and component catalogues developed by the Consultants on the 3D model software shall be delivered including but not limited to piping spec, Insulation spec, bolt spec, nozzle, Complete Piping component catalogues with write-up on naming conventions used for CATALOGUE references, detail texts along with symbol keys & texts.
 - j. OWNER & Consultant and its sub-contractors jointly shall carry out the project creation activity with the help of expert third party agencies in the EDMS platform.
 - k. Electrical drawings in Intelligent format, Intelligent Instrumentation diagrams / hook-up diagrams / instrument loop, smart P&ID handover as per scope defined in the BPCL handover specification.
 - l. A complete 3D model which shall be utilized for all future detailed engineering related to maintenance, operation, revamping and any debottlenecking of the plant as per scope of work defined in the Handover specification. Complete 3D model along with as built GAD's, Isometrics, MTO reports extracted and 3D models for all disciplines, with any other

document generated from 3D model and naming conventions with as-built updates along with complete reference databases, component catalogues for all the size range shall be handed over to OWNER. Apart from the 3D Model, all drawings like GADs, Isometrics etc. extracted from the model shall also be submitted by the Contractor in Electronic form. 3D model along with complete Project databases shall be submitted at each model review stage and as final as-built. The contractor shall also submit all the configuration files, customization files, templates and all referenced databases.

- m. All input files of software used for design of equipment / Piping like CAESAR2 files, input files for Pressure vessel design, TEMA datasheets etc., shall be handed over to BPCL as per BPCL specifications for handover of Engineering Information.
- n. The contractor shall submit the data quality assurance plan for BPCL review and approval to ensure integrity, completeness, consistency and quality of information to be handed over. After the completion of engineering of respective areas, the corresponding complete 3D review model shall be handed over to the employer for its reference.
- o. EPCM shall validate all data and documents will be validated against set standards. Data and documents that does not meet the specified requirements will be rejected and returned for further rework.
- p. Handover Plan: The procedure and time frame for continuous handover of documents and data at various stages of the project including rules and trigger points for handover of data to BPCL shall be at 30%, 60% and 90 % of 3D model stage as per scope defined in the Handover specification.
- q. 40-50% of isometrics along with system ISOs extracted from the 3D Model shall be made available at site prior to the mobilization of mechanical contractor.
- r. Make a presentation on 3D model every 3 months from LOA to enable BPCL to review the progress of engineering.
- s. Consultant shall arrange to provide 3D design review model (network ready, which shall include visual interference check, walk-through animation, video simulation for major equipment placement and removal, visual effect, photo realism etc.), which is extracted from intelligent 3D model, for employer's review as & when desired by employer.
- t. Hold stage wise model review at 30% & 60%, at Consultants Office and 90% at Mumbai Refinery. 60% and 90% 3D models shall include lighting layout along with illumination levels. Extractable 3D model including library files to be submitted at each milestone progress (30%, 60%, 90%, and As Built) in native editable format.
- u. Furnish updated /as built 3D model at the end of project. However, all piping layouts, equipment layouts, floor plans, ducting layout (Air/flue gas, AC, Ventilation etc.), structural arrangement drawings and RCC layout drawings shall necessarily be extracted from the aforesaid 3D model and submitted for employers review along with the 3D review model to enable BPCL to review and approve these drawings.
- v. Database backup of authoring files shall be taken every month.

- w. The consultant shall ensure that 3D model shall be developed & demonstrated with dynamic walk- through facility to check any interference, requirement of operation/ maintenance of instruments/ equipment.
 - x. The consultant is encouraged to generate material take offs/Bill of quantities from the drawings for a faster and accurate purchase order generation.
 - y. The consultant will ensure that all communication is routed through the CDE and in accordance with ISO and Open data standards.
 - z. CONSULTANT should define transmittal and submittal workflows for data management, review mechanism and quality check along with master tag list and naming conventions along with OWNER
5. CONSULTANT to ensure that the consultant should implement the constructability studies digital solution that helps to understand the construction sequencing, construction ease, lifting simulations and identify risks in construction with the help of the 3D model.
 6. CONSULTANT will make sure that Package Contractors deliver all necessary data and meet quality standards. CONSULTANT will be responsible for consolidating data from sub-contractors.
 7. CONSULTANT to ensure all Data originated by the contractors/ Manufacturer/ Suppliers comply with the BPCL's Data requirements.
 8. All the correlation and consolidation of Engineering Data will be done by consultants at their end.
 9. Consultants (CONSULTANTs / PACKAGE Contractor / Vendor / Conventional Contractor) will load the consistent data in the central EPDDMS server maintained by BPCL at each review cycle, aided by bidder in data uploading. EPDDMS server will have segregate project configuration to accommodate data coming from different parties.
 10. The CONSULTANT will ensure that all communication is routed through the CDE and in accordance with ISO and Open data standards
 11. Tools will have to be within the options described in Table. The solutions should be compatible and need to integrate with CDE (common data environment) and control tower. Provide training sessions to ensure proficiency for the tools.

Digital quality Inspection

1. Document detailed SOPs for each inspection process, ensuring clarity and consistency in procedures. Ensure SOPs adhere to international quality standards relevant to oil and gas industry.
2. Develop comprehensive plans outlining the specific tests and inspections required at different stages. Incorporate internationally recognized quality metrics and criteria into the plans.
3. Design digital forms and checklists that align with inspection requirements. Include fields for capturing essential data, observations, and deviations.
4. Implement dedicated software tools and platforms for data capture, storage, and analysis, compatible with EDMS. Choose solutions that offer real-time update and collaboration, ensuring

efficiency in communication. Tools should be able to store and access isometric and 3D drawings on field and allow real time storage of mark ups.

5. Integrate digitized inspection processes with Enterprise Resource Planning (ERP) systems for seamless data flow.
6. Comply with international data protection regulations and standards to ensure inspection data safety.
7. Provide thorough training for inspectors on the use of digital tools and adherence to updated processes. Regularly update training programs to keep inspectors informed about changes.
8. Maintain detailed audit trails for each inspection, ensuring transparency and traceability. This helps in tracking any changes made during the inspection process.
9. Adhere to international documentation standards for quality management systems. Ensure that all digitized documents meet these standards for consistency and compatibility.
10. Ensure integration of other project stakeholders in execution and utilization of the digital quality management system. The EPCM will submit the execution plan to be jointly agreed by CONSULTANT and OWNER.
11. Tools will have to be within the options described in Table. The solutions should be compatible and need to integrate with CDE (common data environment) and control tower. Provide training sessions to ensure proficiency for the tools.

The CONSULTANT will include the following methods where applicable are deployed:

- a. Digital Inspection Tools: Equip inspectors with mobile devices or tablets to conduct inspections electronically. Use dedicated inspection apps that allow for easy input of data, photos, and annotations.
- b. Barcode and QR Code Scanning: Implement barcode or QR code scanning to quickly identify and link items to inspection records.
- c. Mobile Cameras and Image Recognition: Utilize the built-in cameras on mobile devices for capturing images during inspections. Implement image recognition technology to identify defects or issues.
- d. Voice Recognition: Explore the use of voice recognition technology to allow inspectors to dictate observations and findings.
- e. Electronic Forms and Checklists: Design digital forms and checklists that guide inspectors through each step of the inspection. Include dropdown menus, radio buttons, and checkboxes for standardized input.
- f. Real-time Collaboration: Enable real-time collaboration features, allowing inspectors to communicate instantly with colleagues or managers.
- g. GPS and Location Services: Utilize GPS and location services to track and record the geographical location of inspections.
- h. Offline Functionality: Ensure that the digital inspection tools have offline functionality for areas with limited connectivity. Inspectors should be able to capture data even when not connected to the internet.

- i. Automated Data Validation: Implement automated data validation checks to ensure data accuracy and compliance with standards.

Cloud-Based Storage and Integration: Store inspection data securely in the cloud for easy access and retrieval. Integrate the digitized inspection data with other systems, such as quality management or ERP systems.

Digital Safety Management system

- a. Implement digital safety solutions for own and sub-contractors' workforce including smart wearables, RFID based entry and location, CCTV and video analytics-based monitoring, etc.
- b. Work with the contractors to implement safety alert systems (e.g., announcement systems, pager systems, PPE compliance systems) to notify relevant parties in case of safety concerns or anomalies according to safety plan.
- c. Implement strong authentication mechanisms to ensure only authorized devices can access the system. Use role-based access control to manage user permissions effectively.
- d. Maintain detailed audit trails for system activities and user interactions. Generate comprehensive reports for analysis and compliance purposes.
- e. Ensure and monitor implementation of display of safety training videos, gamified training apps and animated dos and don'ts and best practices at appropriate location in the work area.
- f. CONSULTANT shall mandate and establish a system for the traceability of the piping spool POs number/unique ID of the installed pipes by the Package Contractors-vendors/ Site contractors /their sub-contractors.
- g. Facilitate seamless integration with emergency services for quick response in critical situations. Ensure accurate location tracking for emergency response purposes.
- h. Implement robust encryption protocols to secure data transmission. Regularly update and patch software to address potential vulnerabilities. Ensure secure storage of sensitive information on both devices and servers.
- i. Adhere to international privacy regulations (e.g., GDPR, HIPAA) when handling personal data. Clearly communicate data usage policies and obtain explicit user consent.
- j. Tools will have to be within the options described in Table. The solutions should be compatible and need to integrate with CDE (common data environment) and control tower. Provide training sessions to ensure proficiency for the tools.

Automated system for manpower and machine productivity

- a. Design digital forms, formats and checklists that are essentially a replacement to daily progress report in the software/ solution that ensures real time updates and tracking. Include fields for capturing essential data, observations, and deviations, and preload the solution with information as much as possible.
- b. Implement dedicated software or platforms for gathering and capturing productivity data and its storage, and analysis, compatible with EDMS including sub-contractors, minimizing the need of manual intervention

- c. The final authority of the formats for documentation and checklist be will with CONSULTANT.
- d. Implement IoT based solutions to ensure the following:
 - i. RFID/IoT based tracking of deployment/mobilization of manpower – attendance/variance in total mobilization, labor composition vs plan (skilled, semi-skilled, unskilled), average daily working hours.
 - ii. Tracking of manpower productivity- location tracking, productivity by sub-contractor, etc.
 - iii. Tracking of critical machine productivity – including location tracking, utilization, volume of work, fuel efficiency, asset health, etc. List of critical construction equipment to be provided by the consultant to the CONSULTANT. Please find the suggested list of construction equipment, Table. List to be finalized by OWNER later on CONSULTANT suggestions.
- e. To implement the work solutions, consultant and sub-contractors should allow deployment of biometrics, RFIDs, IoT sensors or other equivalent solutions, as mandated and implemented by CONSULTANT on equipment and manpower but the procurement and distribution to all the stakeholders shall be CONSULTANT's responsibility.
- f. Utilize analytics to derive insights from the collected data, aiding in optimizing manpower deployment, equipment utilization, and material flow.
- g. Leverage cloud platforms for storage, analysis, and accessibility of data from anywhere, facilitating collaboration and enabling real-time decision-making.
- h. Implement robust security protocols to safeguard sensitive data, considering the potential risks associated with interconnected devices in an industrial setting
- i. Ensure that the consultant implement the welding management solution that consolidates all isometrics drawings, PQR in an online accessible format and track data of number and quality of joints and productivity of welding team
- j. Ensure that he consultant implement the cabling Management Solution that consolidates cable schedule with detail of type and length, daily upload the progress on the system for turnover. Generate automatic cabling progress report
- k. Set up KPIs and limits of delay% in the progress due to cabling and welding to ensure efficacy of the solutions.
- l. Tools will have to be within the options described in Table. The solutions should be compatible and need to integrate with CDE (common data environment) and control tower. Provide training sessions to ensure proficiency for the tools.

Digital Planning and Scheduling

- a. The CONSULTANT should utilize comprehensive project management tools (primavera or MS projects) that integrate various aspects such as task management, resource allocation, collaboration, onsite as well as off-site.

- b. Implement planning standards to facilitate consistent and accurate planning information across all participants in the project, including but not limited to manufacturers, designers, main contractors, and sub-contractors.
- c. Implement advanced scheduling algorithms within planning tools to automate task sequencing, resource allocation, identify areas of improvement in the schedule, and critical path analysis.
- d. CONSULTANT should explore options that enable equipment manufacturer and vendors to share 3D models for real time remote progress monitoring and issue resolution management, e.g., smart glasses.
- e. Ensure that the Package / Conventional contractors / Vendors implement digital piping fabrication control solution that can assess which piping loop can be fabricated based on inventory available.
- f. CONSULTANT shall mandate and establish a system for the traceability of the piping spool POs number/unique ID of the installed pipes by the Package / Conventional contractors / Vendors.
- g. Tools should provide robust resource management features, enabling efficient allocation and utilization of resources which helps in preventing bottlenecks and ensures optimal workforce productivity.
- h. The CONSULTANT should ensure that master schedules along with Level 1 to Level 5 schedules have been resource loaded and aligned with their respective 4D Models to ensure transparency between Planning teams and Field Construction teams.
- i. Set up regular monitoring and reporting mechanisms within the tools to track progress, identify deviations from the schedule, and address issues promptly.
- j. Tools will have to be within the options described in Table. The solutions should be compatible and need to integrate with CDE (common data environment) and control tower. Provide training sessions to ensure proficiency for the tools.
- k. Project Milestones for Digital scope

Digital specific milestones shall be as follows:

CONSULTANT should bring best in-class solutions/digital tools for the specified use cases. CONSULTANT will ensure that the implemented solutions are from the list below.

Table: Suggested digital solutions for specific use cases

Use Case	Type of Solution	Suggested solutions
Control Tower (CT)	Dashboard	PowerBI
		Tableau
		Customizable SaaS solution
EDMS	EDMS	Bentley

(OWNER defined)		Aconex
		HxGN SDx
		Aveva
3D Model/ BIM (OWNER defined)	3D BIM software	Bentley
		Intergraph
		Aveva
		Autodesk (except AutoCAD)
Real-time availability of yard-wise inventory & in-transit	WMS	SAP EWM
		Oracle WMS
	TMS	SAP TM
		Oracle TM
Digital Safety Management system	Safety protocols monitoring	Open - depending on base platform provider
Quality	Base platform	Autodesk (except AutoCAD)
		Trimble
		Procore
		Bentley
Automated system for manpower and machine productivity	Deployment and Productivity monitoring software	System compatible with chosen CDE, CT
	Biometrics, RFID, IoT sensors	System compatible with chosen CDE, CT
Digital Planning and Scheduling	Planning Software	Primavera
		MS Projects

Table: KPIs to be tracked in Control Tower

Sr. No	Category	KPIs
1	Overall KPIs	Milestones and work progress
2	Overall KPIs	Approvals/ Tasks pending with user
3	Overall KPIs	Timeline - Planned vs actual
4	Overall KPIs	Time to complete
5	Overall KPIs	Cost to complete
6	Overall KPIs	Invoicing
7	Overall KPIs	P&M deployment
8	Overall KPIs	Staff deployment
9	Overall KPIs	Labor deployment
10	Overall KPIs	Labor downtime
11	Overall KPIs	Staff and Labor Turnover Rate
12	Overall KPIs	Tendering Cost
13	Overall KPIs	Procurement Cost
14	Overall KPIs	Total Cost
15	Overall KPIs	Risk Management
16	Overall KPIs	Stakeholder Management (important meetings)
17	Overall KPIs	Statutory approval tracker
18	Productivity	Deployment productivity
19	Productivity	Manpower productivity
20	Productivity	Machine productivity
21	Engineering	BDEP status Licensed units
22	Engineering	BEDP status Open Art units and U&O
23	Engineering	3D Model Review
24	Engineering	Detail Engineering status
25	Procurement	Upcoming tenders
26	Procurement	Live tenders
27	Procurement	MR to LOA cycle timelines

Sr. No	Category	KPIs
29	Procurement	Procurement budget plan vs actual
30	Procurement	Tendering budget plan vs actual
31	Procurement	Critical equipment Delivery Planned vs Actual
32	Construction	Structural steel fabrication - planned versus actual
33	Construction	A/G piping fabrication plan and actual
34	Construction	Critical equipment downtime
35	Contracts admin	Contracts executed
36	Contracts admin	Claims
37	Contracts admin	Change orders
38	Contracts admin	Dispute resolution
39	QHSE	Quality NCR
40	QHSE	Safety incident rate
41	QHSE	Safety NCR
42	QHSE	Inspection conducted and metrics
43	Finance	Payables status and ageing
44	Finance	% of claims of cost / cost of rework
45	Finance	Cost variance

Table: Suggestive list of construction equipment, not exhaustive

Equipment
Excavators
Bulldozers
Pavers
Dump Truck
Compactors
Backhoe Loader
Graders
Scrapers
Trenchers
Bucket Crushers
Concrete Pump
Drills
Boom lift
Forklift
Mobile cranes
Tower cranes
Common parameters to be tracked
Location
Start and stop
Diesel consumption

Application Security / Cyber-Security Checklist

1. Non-Disclosure Agreement (NDA) should be signed between the BPCL SBU/Entity and the Contracting Agency as well as between contracting agency and their service providers before start of the contract.
2. Data center on which the application to be hosted should preferably be within India, unless there is strong justification for hosting it outside.
3. Access to the applications should be preferably restricted to India Region.
4. Cloud Service Provider should maintain accreditation by MeitY or Local accreditation agency (for data hosted outside India).

5. Cloud Service Provider should maintain relevant security standards. e.g.
 - a. ISO/IEC 27001 (Information Security Management)
 - b. ISO/IEC 27018 (Code of Practice for Protecting Personal Data)
 - c. SOC 2 (Service Organization Controls standards for operational security)
6. Backups of all components are taken periodically (to be decided by the business) to ensure the availability of data & the relevant applications in case of a major failure or Security Incidents.
7. Network/ perimeter should be protected through Firewall and Intrusion protection system (IPS / IDS).
8. All components including Operating System, DB, Web server, application server, Network & Security devices etc. should be hardened before deployment of any new solution.
9. Patching and rebooting of systems (if applicable) should be done on periodic basis.
10. The servers should be protected through a leading Anti-virus/ Anti-malware solution.
11. Exchange of data should be carried on encrypted channel only using SSL.
12. In case of confidential data, the data at rest should be encrypted.
13. Default passwords should be changed at all layer of components including Operating System, Application administrators, Web Servers, Database administrators, Network & Security devices & all other related systems. Passwords should be complex. Passwords should be changed periodically.
14. Local Administrator accounts should be renamed.
15. Unused accounts should be disabled or deleted.
16. Vulnerability Assessment Penetration Testing (VAPT) and Web Application Penetration Testing (WAPT) should be done at least once in a year by CERT-In empaneled security auditing firms (for application hosted within India)/ Third Party Security Auditor (for data hosted outside India) and all Critical vulnerabilities should be closed within 24 hours and High vulnerabilities within 3 days. VAPT should cover OS, DB, Web server, App Server, Application level (WAPT) as well as Network and Security solutions.
17. VAPT/ WAPT should also be repeated before roll-out of a major upgrade.
18. Any unused published web services/ APIs for information exchange should be taken down.
19. All whitelisted IP addresses should have access only of a specific service/ ports.
20. All outgoing access to public Internet from servers must be restricted to limited IP addresses or URLs only as per the business requirement.
21. All types of clear-text protocols such as TELNET, FTP etc. must be disabled.
22. Software with valid licenses & support should only be deployed.
23. All Internet-facing web applications should have Web Application Firewall (WAF) protection.
24. Logging should be enabled at all layers of devices and provide logs for auditing/forensic investigations as and when requested by BPCL.
25. Contracting Agency should extend necessary support for incident analysis/ forensics in case any cyber security incident is observed.

CHAPTER 6

BULK MATERIALS

The following materials shall be considered as BULK MATERIALS for the purpose of calculation of cost of Surplus Materials as per the provisions of as per the provisions of tender document.

BULK MATERIALS MECHANICAL:

Pipes (length beyond 3 meters)

Pipe fittings

Valves

Flanges

Steam traps

Steel plates

CIVIL:

Structural Steel, Reinforcement Steel

ELECTRICAL:

HT and LT cables (length beyond 100 meters)

Control cable (length beyond 100 meters)

Light fittings

Junction boxes and cable glands

INSTRUMENTATION:

Signal and Thermocouple extension cables (length beyond 100 meters)

SS/ copper tubes and tube fittings

Instrument Valves and Manifolds

Junction boxes and cable glands

Instrument Power Cables

OFC Cables

**TENDER FOR ‘ENGINEERING, PROCUREMENT & CONSTRUCTION
MANAGEMENT (EPCM) SERVICES FOR PETRO RESID FLUIDIZED
CATALYTIC CRACKING (PRFCC) UNIT AND ASSOCIATED FACILITIES
PROJECT’ OF BPCL MUMBAI REFINERY**

TENDER REF. NO. : 1000440719

SPECIAL CONDITIONS OF CONTRACT (SCC)

Contents

1.	GENERAL	4
2.	DEFINITIONS	4
3.	PROJECT	7
4.	SCOPE OF WORK.....	7
5.	OBLIGATIONS OF OWNER	8
6.	PROJECT SITE LOCATION	9
7.	SAFETY AND SECURITY REGULATION	9
8.	MECHANICAL COMPLETION OR READY FOR PRECOMMISSIONING AND PROJECT COMPLETION.....	9
9.	TIME OF COMPLETION	10
10.	PRICE FORMAT	12
11.	ESCALATION	13
12.	TERMS OF PAYMENT.....	13
13.	CURRENCIES OF PAYMENT	15
14.	COMPENSATION FOR DELAY(“CD”)	15
15.	SECURITY DEPOSIT	16
16.	CUSTOMS DUTY	16
17.	TAXATION.....	17
18.	ADHERENCE TO GOVERNMENT GUIDELINES	17
19.	WARRANTEES, GUARANTEES:	17
20	DOCUMENTATION.....	21
21	CONSULTANT 'S WORK AND RESPONSIBILITIES.....	22
22	CONSULTANT 'S ACCEPTANCE OF THE WORK.....	22
23	STANDARDS OF PERFORMANCE.....	23
24	LIST OF MILESTONES.....	25
25	RIGHT TO INSPECT	25
26	ACCEPTANCE PROCEDURE	26
26A	Deleted	27
27	COMPLETION CERTIFICATE:.....	28
28	INSURANCE-.....	28
29	CONFIDENTIAL INFORMATION AND SECRECY	30
30	PATENT INDEMNIFICATION	31
31	TITLE	32
32	PROPRIETARY INFORMATION, COMPUTER DATA, LICENSES AND INVENTIONS	32
33	FORCE MAJEURE: - as per GCC	34
34	DISPUTE RESOLUTION	34

Special Conditions of Contract - Tender Ref. No. 1000440719

35	JURISDICTION	35
36	SUSPENSION, TERMINATION AND CANCELLATION: - as per GCC	35
37	DROP DEAD FEES	35
38	MISCELLANEOUS	35
39	CLAIMS BY CONSULTANT:	37
40	SOLE CONTRACT:	38
41	EXCLUSION OF THE GOVT. OF INDIA'S LIABILITY	38
42	CESSATION OF RESPONSIBILITIES.....	38
43	PARTICIPATION IN CONTRACTS FOR PROJECT EXECUTION:	39
44	PERMITS & APPROVALS REQUIRED FOR FOREIGN EXPATRIATES:	39
45	INTERACTION WITH OTHER AGENCIES:.....	39
46	STATUTORY APPROVALS:	39
47	CONSULTANTS ORGANIZATION STRUCTURE FOR THE PROJECT	39
48	POSTING OF CONSULTANT'S PERSONNEL TO LICENSOR'S/PACKAGE CONTRACTOR'S OFFICE.....	40
49	OFFICE ACCOMODATION FOR OWNER'S STAFF IN THE ENGINEERING OFFICE OF THE CONSULTANT IN INDIA:	40
50	VALIDITY OF THE OFFER	40
51	[Deleted]	40
52	DEVELOPMENT OF MSE	40
53	COMPLIANCE OF GOVERNMENT SOCIAL SECURITY SCHEMES	41

List of Appendix to SCC:

Appendix-1	Price Schedules and formats along with Preambles
Appendix-2	Project Facilities Plot Plan

SPECIAL CONDITIONS OF CONTRACT

1. GENERAL

- 1.1 General Conditions of Contract (“GCC”) of BPCL-MR shall be applicable to this job.
- 1.2 Special Conditions of Contract (“SCC”) shall be read in conjunction with the General Conditions of Contract, Scope of Work, drawings and any other document forming part of this Contract wherever the context so desires.
- 1.3 It will be presumed that the Consultant has read, understood and accepted all the conditions stipulated in GCC to the extent as applicable.
- 1.4 Notwithstanding the sub-division of the document into separate sections and volumes wherever done, every part of each shall be deemed to be supplementary of every other part and shall be read with and as part of the contract so far as it may be practicable to do so.
- 1.5 Where any portion of the General Conditions of Contract are inconsistent with, repugnant to or at variance with any provisions of the Special Conditions of Contract, then unless different intentions appear, the provisions of the Special Conditions of Contract shall be deemed to override the provisions of the General Conditions of Contract and shall to the extent of such inconsistency, repugnancy, or variations prevail.
- 1.6 Wherever it is mentioned in the tender document that the Consultant shall perform certain work or provide certain facilities, it shall be understood that same shall be effected/carried out by the Consultant at his own cost, unless a different intention is specifically and expressly stated herein or otherwise explicit from the context.
- 1.7 Consultant is advised to acquaint themselves fully before firming up their offers, the description of work, scope of services, time schedule and terms and conditions including all the provisions of the Tender.

2. DEFINITIONS

For the purpose of the CONTRACT, unless otherwise specified or repugnant to the subject or context, the following terms shall be deemed to have the following meanings:

- 2.1 **"AFFILIATES"** shall mean in relation to any company another company;
 - (a) Which it Controls; or
 - (b) Which Controls it; or
 - (c) Which in turn is controlled by a company, which also Controls it; where "Control" means to own, directly or indirectly, more than fifty per cent (50%) of the issued and outstanding voting stock.
- 2.2 **"AUTHORIZED REPRESENTATIVE"** shall mean OWNER'S/ CONSULTANT'S representative, authorized to act for and on behalf of OWNER/ CONSULTANT, respectively.
- 2.3 **"BASIC DESIGN ENGINEERING PACKAGE"** or **"BDEP"** for licensed unit and open art unit shall mean the process package submitted by Licensor and PMC respectively after review, consistency check and necessary customization by PMC based on the requirement from OWNER/PMC. BDEP for OSBL shall mean the process package developed by PMC in consultation with OWNER.
- 2.4 **"BATTERY LIMIT"** or **"ISBL"** shall mean the demarcated area within which all the Units and facilities under CONSULTANT'S scope as detailed in the CONTRACT are being installed for PLANT.

Special Conditions of Contract - Tender Ref. No. 1000440719

- 2.5 **"BPCL"** or **"OWNER"** shall mean Bharat Petroleum Corporation Ltd, a Company registered under Companies Act, 1956 and having its registered Office at Bharat Bhavan, 4&6, Currimbhoy Road, Ballard Estate, P B No 688, Mumbai - 400001 and shall include its successors and permitted assigns.
- 2.6 **"BPCL-MUMBAI REFINERY"** or **"BPCL-MR"** means the Mumbai refinery, a unit of BPCL located at Mahul, Mumbai, Maharashtra, India
- 2.7 **"CAUSTIC MEROX"** means the Merox Process in which the oxidation is carried out in the presence of a water soluble alkali or alkaline earth metal hydroxide.
- 2.8 **"COMMISSIONING"** shall mean pressing into service the unit(s), equipment(s), vessels, pipeline(s), machinery and systems & sub systems comprised within the PLANT in accordance with procedures as approved in PLANT specific and as per the requirement of process Licensor which is the subject matter of operating manual the contract after a complete successful testing and trial run of the PLANT for atleast 72 hours of continuous run.
- 2.9 **"CONTRACT"** shall mean these SCC read with the GCC including all Annexures and all documents therein attached and amendments which the parties may hereafter agree in writing to be made to this Contract.
- 2.10 **"CONTRACTOR"** shall mean any third party whose services are obtained for execution and/ or erection of Units/ facilities covered under CONSULTANT'S Scope of Work.
- 2.11 **"CONSULTANT"** or **"ENGINEERING, PROCUREMENT & CONSTRUCTION MANAGEMENT"** or **"EPCM"** shall mean the bidder selected by the OWNER for this consultancy job for the subject project and shall include the successors and permitted assigns of the CONSULTANT.
- 2.12 **"DESIGN BASIS"** shall mean requirements as agreed between OWNER and CONSULTANT for undertaking basic and detailed engineering of the PLANT/ Utilities & Offsites under CONSULTANT'S Scope of Work.
- 2.13 **"ENGINEERING DESIGN BASIS"** shall mean requirements as agreed between OWNER and CONSULTANT for performing engineering design of PLANT/ Utilities & Offsites under CONSULTANT'S Scope of Work.
- 2.14 **"FRONT END ENGINEERING DESIGN (FEED)"** for PRFCCU and ARU shall mean the necessary customization of BDEP of PRFCCU (including Part PRU & Caustic Merox, excluding wet gas scrubber) and ARU (excluding PTU).
- 2.15 **"LICENSOR"** shall mean agency responsible for the supply of basic know-how and process package for the licensed units.
- 2.16 **"LLI"** shall mean long lead items for project and are defined as any type of material/equipment which requires 14 (Fourteen) months or above for supply to the project site from the date of respective award of CONTRACT.
- 2.17 **"MECHANICAL COMPLETION"** OR **"READY FOR PRECOMMISSIONING"** shall mean completion of PLANT/Utilities & Offsites as defined in the CONTRACT.
- 2.18 **"MEROX PROCESS"** means a process for treating hydrocarbons for the oxidation of mercaptans contained therein to disulfides and/or for the removal of mercaptans contained therein and the oxidation of the resultant mercaptan compounds to disulfides, in which process the oxidation is effected or influenced by a catalyst or catalytic material containing an iron-group metal chelate.
- 2.19 **"OUTSIDE BATTERY LIMIT FACILITIES"** or **"OSBL"** or **"UTILITIES & OFFSITE"** shall mean the Utilities & Offsite which are required to be set up outside the BATTERY LIMIT of process & open art unit.

Special Conditions of Contract - Tender Ref. No. 1000440719

- 2.20 **"PACKAGE Contractor"** shall mean any third party whose services are obtained for engineering, procurement, supply, and construction, with or without free issue material (FIM), of a single or multiple packages of the unit/facilities/system, which the Consultant may suggest during the course of the project for the betterment of project implementation, considering project schedule and cost. The same may be implemented in consultation with the OWNER.
- 2.21 **PERFORMANCE TEST**" shall mean the test or series of tests to be carried out as defined in the CONTRACT.
- 2.22 **"PLANT"** shall mean the Units and facilities comprised in the PROJECT, and if divided into different packages for the award of Contracts/ Work Contracts/ Supply Contracts, shall mean the Unit(s) and/ or facilities comprised in each package.
- 2.23 **"PRE-COMMISSIONING"** shall mean all activities' required to be performed after final tests for all plant, equipment & machinery comprised within the PLANT which is the subject matter of the CONTRACT to bring the equipment covered from an inactive condition to a state ready for trial run and shall include but not limited to checking of systems and vessels, flushing and steam blowing, air blowing of pipelines, system leak checking up to the specified pressure, purging the system using inert gas, checking of total instrumentation system of the plant, checking of electrical equipment for proper earthing, installation of resistance, conducting operability tests on individual equipment, vessels and system and other activities required to be performed in terms of the contract & division of responsibility between the OWNER & CONSULTANT after final tests and before commissioning/trial run of the Unit.
- 2.24 **"PRFCCU"** shall mean Petro Resid Fluidised Catalytic Cracking Unit.
- 2.25 **"PROCESS DESIGNER"** shall mean agency responsible for the supply of basic know-how and process package for the process units/ facilities.
- 2.26 **"PROCESS PACKAGE"** shall mean the process package/set of data supplied by OWNER/ LICENSOR/PMC sufficient for proceeding with basic/ detailed design, engineering and other activities related to Plant, where a basic process package for PRFCCU (including Part PRU & Caustic Merox, excluding wet gas scrubber) and ARU (excluding PTU) Unit, prepared by the Licensor/PMC/Owner but which shall be duly validated by the CONSULTANT.
- 2.27 **"PROJECT MANAGEMENT CONSULTANT or "PMC"** shall mean previously deployed by OWNER for carrying out pre-project activities including viz., detailed feasibility report (DFR), review, consistency check and necessary customization of Process Package submitted by LICENSOR and submission of Process Packages of open art unit and Utilities & Offsites.
- 2.28 **"SERVICES"** shall *have* the same meaning as **WORK**.
- 2.29 **"START-UP"** shall mean all activities required to be performed after pre-commissioning and prior to trial operation and shall include final pre-commissioning inspection and check out of equipment, vessels & system and supporting sub system, initial operation of complete equipment and systems within the PLANT to obtain necessary pre-trial operation data. Confirmation and correction of calibration & change of safety interlock control loop, if required, shutdown inspection and adjustment and steps required to be taken prior to and enable commissioning/ trial operation.
- 2.30 **"SYSTEM"** shall mean the breakdown of the PLANT into precisely demarcated sections or components other than UNIT as detailed in the CONTRACT to facilitate smooth start up and commissioning of the PLANT.
- 2.31 **"TENDER"** shall mean the tender submitted by the Contractor for acceptance by the Owner.
- 2.32 **"VENDOR"** shall mean any third party supplying any of the equipment/ materials for setting up PLANT/ Utilities & Offsites covered under CONSULTANT'S Scope of Work.
- 2.33 **"WORK"** shall mean the responsibility to be discharged by the CONSULTANT for fulfilling its obligations under this CONTRACT.

2.34

2.35 "UNIT" shall mean a particular process unit etc. which forms a distinct operating system and is a part of the PLANT.

3. PROJECT

Project shall mean activities required for realization of Units and facilities for the PRFCCU Project at the OWNER'S refinery at Mumbai for which CONSULTANT is to provide Services under this CONTRACT.

4. SCOPE OF WORK

The broad scope of work of EPCM Consultant (the "Scope of Work") is as follows:

ENGINEERING, PROCUREMENT & CONSTRUCTION MANAGEMENT (EPCM) services for PRFCCU and its associated facilities Project at BPCL - MR- Overall project management, Developing project procedures and project management plan, activities as listed in technical scope, review, updation, preparation and finalization of Basic Design Engineering Package (BDEP) / Process Package/ Design Basis submitted by Process Licensor(s) / PMC, review, updation, preparation and finalization of BDEP/ Front-End Engineering Design (FEED) for all Licensed & open art units, review, updation, preparation and finalization of Basic Design Engineering Package for OSBL (Utilities & Offsite), detailed and residual engineering for PRFCCU / ARU / SWS / PRU(Part), PTU, Caustic Merox and Utilities & Offsite facilities, tendering & award of work packages/conventional items and other work/contract packages, tendering and award of LLI's, other equipment & items, preparation of Tender documents, tendering and award of contracts, review of detailed engineering documents by vendors/contractors, IBR package preparation/ Coordination with GBI for obtaining IBR certification, assistance for statutory approvals / clearances, procurement & contract services assistance, project monitoring, inspection & expediting, quality management, assistance for transportation of over dimensional consignments including route survey, material control & warehouse management, construction management & supervision including quality assurance, mechanical completion, assistance in start-up, Pre-Commissioning, Commissioning & performance guarantee test run (PGTR) activities and project closure activities including final bill/invoice for the project at Mumbai refinery of Bharat Petroleum Corporation Limited, India in line with the bidding documents, specifications and conditions.

The proposed project consists of the following major facilities:

- Petro Resid Fluidized Catalytic Cracking (PRFCC) of 3.0 MMTPA licensed by M/s. UOP LLC, USA.
- C3/ C4 Splitter of Propylene Recovery Unit (PRU Part) licensed by M/s. UOP LLC, USA.

Note: PRFCCU block consists of PRFCCU, PRU(Part) as a single complex.

- Amine Regeneration Unit (ARU) to process ~8500 MT/D Rich MDEA.
- Caustic Merox and Purge treatment unit (PTU): The Unsaturated LPG Treating Unit removes Sulphur compounds (Mercaptans, H₂S and COs) from amine washed LPG received from PRFCC.

Note: ARU, Caustic Merox and PTU are envisaged as a complex in single location. The decision to locate the PTU within the ARU–Caustic Merox block or elsewhere within the refinery premises shall be jointly made by the OWNER and the Consultant.

- Sour Water Stripper (SWS-4): Revamp required to accommodate additional ~65 m³/hr of sour water from PRFCCU.
- Associated Utilities and Offsites including standalone and augmenting the existing facilities.

Special Conditions of Contract - Tender Ref. No. 1000440719

The Project consists of licensed process units, Open Art units along with utilities, offsites and other infrastructure facilities.

In addition to the foregoing details of Consultant's Scope of Work shall be supplemented by the 'Technical Section- Scope of Work' of Tender document.

5. OBLIGATIONS OF OWNER

Obligations as described hereinafter shall be discharged by OWNER whichever applicable within an agreed time schedule to CONSULTANT unless otherwise mentioned.

- 5.1 OWNER shall furnish drawings/ details of existing location to the extent necessary and available with the OWNER, bench mark details, geographical & seismic data, characteristics and Battery Limit condition of utilities. In case some new drawings are required to be developed, CONSULTANT shall develop the same at no extra cost to the OWNER.
- 5.2 Required hook-up points at various locations with the existing system shall be identified by the CONSULTANT in consultation with the OWNER/Licensors. Associated drawings, schemes, procurement of material, plan for execution and all other services related to above shall be provided by CONSULTANT for its execution through Contractors. OWNER will provide necessary clearances for executing the hook-ups.
- 5.3 OWNER, jointly with CONSULTANT shall finalize details regarding pressure, temperature and flow of various utilities required at the respective Battery Limits.
- 5.4 Deleted.
- 5.5 OWNER shall furnish necessary technical data to the extent available to finalize ENGINEERING DESIGN BASIS.
- 5.6 OWNER shall place direct orders with VENDORS based on Consultant's recommendations and enter into direct contracts with Vendors and other agencies for supply of all equipment, materials and construction service required for the PROJECT, however, CONSULTANT shall be the engineer-in-charge (E-I-C) for all the Work Contracts.
- 5.7 OWNER shall permit CONSULTANT and its authorized construction personnel to freely move, in and out of the site, subject to the observance of security and safety regulations of OWNER.
- 5.8 OWNER shall appoint and make available to CONSULTANT throughout the tenure of the PROJECT, a representative duly authorized to act for and on behalf of OWNER with respect to any and all provisions of this CONTRACT. CONSULTANT shall be advised in writing the name and address of such representative and in case of any change, the same shall also be notified to CONSULTANT.
- 5.9 Subject to Clause 21.5, Clause 23.3.2, Clause 23.5 and Clause 23.6, OWNER shall obtain necessary licenses, permits, etc. like, statutory approvals/ clearances from CCE, IBR etc. required in connection with the construction, erection and operation of the PLANT. However, as mentioned earlier, CONSULTANT shall render all assistance including development of documents for statutory approvals like IBR, CCE/PESO, Factory inspectorate, Maharashtra State Pollution Control Board, Industrial Licensors etc. to OWNER to obtain these licenses, approvals, clearances, permits and allocations, connected with the PROJECT. For PACKAGE contracts, all necessary approvals such as IBR etc. shall be obtained by the Package contractor.
- 5.10 OWNER shall maintain adequate budget allocation for PROJECT implementation so that the same is not hampered for want of funds.
- 5.11 OWNER will provide land free from any encumbrance required for the PROJECT.
- 5.12 For CONSULTANT'S staff posted at site, OWNER shall provide the following facilities:
 - a) Furnished office facilities including its maintenance thereof required for the performance of Consultant's services except for the Computer and associated software, Internet connection, printers

Special Conditions of Contract - Tender Ref. No. 1000440719

& reproduction facilities which shall be arranged by consultant. Power and water for consultant's office and office facilities also will be provided by BPCL free of cost.

- 5.13 BPCL shall not provide facilities such as housing in their township or any school facility to the Consultant staff/their families.
- 5.14 OWNER shall carry out start-up and commissioning operations in consultation with LICENSOR/ PROCESS DESIGNER. CONSULTANT to assist in start-up /commissioning activities.
- 5.15 OWNER shall provide all operating, maintenance and supervisory personnel including technicians for commissioning and performance test runs. However, Consultant shall provide key commissioning staff for smooth start up and commissioning of unit and associated facilities.
- 5.16 OWNER shall provide a copy of the GCC (General Conditions of Contract) & GPC (General Purchase Condition) to be incorporated in the bid documents for work/ purchase tender for the Contractor, suppliers and vendors. However, Consultant shall review the same and incorporate necessary changes in the CONDITIONS OF CONTRACT after taking due approval from OWNER.
- 5.17 No media advertisement is envisaged. Nonetheless, in case undertaken, the cost shall be borne by Owner.

6. PROJECT SITE LOCATION

All facilities envisaged under the PRFCCU Project are proposed to be located within the premises of the Mumbai Refinery of Bharat Petroleum Corporation Limited, in Mumbai, Maharashtra. The project site is near the coastal area. A plot plan showing the project facilities, prepared by the PMC, is attached as **Appendix 2**. No major changes or relocations are envisaged, except for two facilities pertaining to cooling tower system (incl. Cooling tower substation & Caustic tank) and the control room (incl. Satellite Rack Room) which may need to be relocated, subject to Coastal Regulation Zone approval as detailed in the 'Technical scope of Work'.

The Consultant shall submit a detailed overall project plot plan after the completion of detailed engineering.

The Consultant should inspect the site and familiarize themselves with the site conditions before submitting their bid.

7. SAFETY AND SECURITY REGULATION

- 7.1 The CONSULTANT shall abide by the safety and security regulation as enforced by the OWNER from time to time. The CONSULTANT shall comply with all rules, regulations and orders of various statutory authorities, insurance, engineer-in-charge of BPCL, etc. at no extra cost to the OWNER.
- 7.2 The CONSULTANT, shall at his own expense, shall provide and maintain sufficient proper and lifesaving and first aid appliances at their workstation at site.
- 7.3 A detailed Safety Plan for all activities at site for a particular job is to be obtained from Contractors, wherever necessary and submitted to OWNER.
- 7.4 As per CVC guidelines, hindrance registers, as per OWNER's format, are to be maintained by the engineer in charge (Consultant) for each functional area during the tenure of the Project.

8. MECHANICAL COMPLETION OR READY FOR PRECOMMISSIONING AND PROJECT COMPLETION

- 8.1 In general, all standards and specifications shall be developed by Consultant for the PRFCCU project subject to approval by Owner/Licensor as applicable and also meeting all statutory, OISD requirements etc. and standards applicable to Oil & Gas / Petroleum industry. OISD/TAC guidelines as well all other standards as required for an Oil & Gas / Petroleum plant shall apply.

Special Conditions of Contract - Tender Ref. No. 1000440719

- 8.2 Mechanical Completion: On completion of Work(s) by the contractors, CONSULTANT shall carryout detailed checking of the complete systems/ facilities/ Work and shall prepare punch lists as soon as possible indicating the outstanding items & procedures required for their completion or rectification before the MECHANICAL COMPLETION and shall coordinate with the Contractor(s) to attend to all jobs, including completion of all additional punch list items as provided by OWNER and/ or Licensors and regulatory bodies like OISD, CCE, TAC, Factory inspector etc. to make the Plant ready for pre-Commissioning jobs. CONSULTANT should perform a separate walkdown in the ISBL/OSBL facilities so as to avoid any mistakes and ensure compliance to drawings/standards. CONSULTANT should prepare a separate punch list after walkdown as per their approved drawings to ensure that PACKAGE contractors has constructed the facilities as per approved drawing. PACKAGE Contractors will prepare a separate punch list by themselves. CONSULTANT should ensure that all the points of all the punch lists (Owner, Licensor, CONSULTANT and various PACKAGE Contractors) are implemented on field by the various PACKAGE Contractors to the satisfaction of Owner. Upon satisfactory completion of all the items of the punch lists of the UNITS/ PLANTS/ systems, CONSULTANT shall recommend to OWNER the issue of Mechanical Completion Certificate(s). OWNER will take over the Plant for Pre-Commissioning, Start Up, Commissioning and Performance test. However, CONSULTANT shall provide assistance services during Pre-Commissioning, Start Up, Commissioning and Performance test.
- 8.3 Project Completion: When the construction of the PLANT has been completed, other than in minor respects which do not prevent Commissioning, all civil engineering is completed, all equipment and machinery are installed and aligned, all piping and instrumentation work is completed including insulation & painting, all electrical work is completed, all hydrostatic/ pneumatic testing is done, speed and direction of rotation of all prime movers is checked, relays are set and all scales, meters, measuring devices and recorders are calibrated, all instrumentation jobs are completed in all respect as per requirements, all the loops and interlocks are tested, all the Pre-Commissioning check list points are completed, Startup activities are completed and Plant is ready for commissioning for pressing into service, the CONSULTANT shall notify OWNER as Project completion.
- 8.4 The Commissioning and Product diversion to storage from PRFCC unit shall be deemed to be the date of CONTRACTUAL COMPLETION for the purpose of this CONTRACT.

9. TIME OF COMPLETION

- 9.1 The time schedule is as given below:

The contractual completion of the entire project facilities of PRFCCU and associated units of Bharat Petroleum Corporation Limited, Mumbai Refinery including Mechanical completion and Commissioning is 47 (forty-seven) months from date of award of contract/LOA (Letter of Acceptance) to the Consultant.

PRFCCU and associated facilities shall be mechanically completed within 43 (forty-three) months from the date of issue of LOA/FOA or PO whichever is earlier to the consultant.

Commissioning of the Units shall be completed within 4 (four) months from the date of Mechanical Completion.

Milestones of Delivery ("Milestones")	TIME LIMIT
Review, Update, prepare and Finalize ENGINEERING DESIGN BASIS	Within 1 (one) Month from the date of LOA
P&ID Review for Licenses Units and Open Art Units at Consultant office / Owner Office	Within 2 (two) Months from the date of LOA
Hazop and SIL Review for Licenses Units and Open Art Units at Consultant office / Owner Office	Within 3 (three) Months from the date of LOA

Special Conditions of Contract - Tender Ref. No. 1000440719

Preparation and floating tender for PRFCCU RR Package	Within 3 (three) Months from the date of LOA.
Review, Update, prepare and Finalize BDEP / FEED / PROCESS PACKAGE for Licensed Units	Within 4 (four) Months from the date of LOA
Review, Update, prepare and Finalize FEED / BDEP / PROCESS PACKAGE for Open Art Units	Within 4 (four) Months from the date of LOA
Review and Finalize Plot plan, Equipment layout for PRFCCU- PRU (Part) Block.	Within 5 (five) Months from the date of LOA
PRFCCU Civil Package 1: Preparation and floating tender for Civil, Underground and Structural Works	Within 5 (five) months from the date of LOA
Review, Update, Prepare and Finalize Plot plan, Equipment layout for ARU-Caustic Merox-PTU Block.	Within 6 (six) Months from the date of LOA.
<u>Licensed & Open Art Units:</u> Preparation and floating tenders for critical long lead items.	Within 6 (six) Months from the date of LOA.
Prepare and Finalize layout and sizing of Substations, Control Rooms.	Within 10 (ten) Months from the date of LOA.
P&ID Review for Utilities & Offsites at Consultant office / Owner Office	Within 10 Month from the date of LOA
Hazop and SIL Review for Utilities & Offsites at Consultant office / Owner Office	Within 12 Month from the date of LOA
Prepare and Finalize Plot plan, Equipment layout for Utilities & Offsites facilities	Within 12 (twelve) Months from the date of LOA.
<u>Utilities & Offsites:</u> Preparation and floating of tenders for critical long lead items	Within 13 (thirteen) Months from the date of LOA.
<u>Licensed & Open Art Units:</u> Preparation and floating of tenders for other than critical/LLI packages and balance packages including PACKAGE /Works contracts.	Progressively along with critical packages but not later than 17 (seventeen) months from the date of LOA.
<u>Utilities & Offsites:</u> Preparation and floating of tenders for other than critical/LLI packages and balance packages including PACKAGE /Works contracts.	Progressively along with critical packages but not later than 19 (nineteen) months from the date of LOA.
Completion of fabrication & erection of Major jobs of Reactor Regenerator (RR) Package contract and plot (Rest of RR Package area) clearance for commencement of Civil, UG & Structural Package 2.	Within 24 (twenty-four) Months from the date of Award of RR Package
Award recommendation of critical long lead items.	1.5 months from the date of opening technical bids for respective item (This time is excluding time taken by BPCL in intermittent approvals if any).
Award recommendation of other than critical/LLI packages and balance packages including PACKAGE/Works contracts	Within 1.5 months from the date of opening technical bids for respective item (This time is excluding time taken by BPCL in intermittent approvals if any)
Mechanical Completion of the Project Facilities	Within 43 (forty three) Months from the date of LOA.
Commissioning of the Project Facilities	Within 4 (four) months from Mechanical Completion.

Special Conditions of Contract - Tender Ref. No. 1000440719

- 9.2 The CONSULTANT shall submit a project time schedule post award of contract, indicating critical activities, their duration and expected completion date, meeting the overall project completion date.
- 9.3 Commencement of Work: CONSULTANT shall commence the Work from 0 (zero) date, which shall be the date of issuance of LOA. A kickoff meeting to be arranged within 2 (two) weeks from the issuance of LOA. The effective date for the start of the EPCM services shall be the date of issue of LOA, to proceed with the EPCM activities of the project and shall thereafter use its reasonable required efforts and resources to perform its obligations pursuant to this Contract in accordance with the Time Schedule. CONSULTANT recognizes the importance to Owner of the completion of the Work in accordance with the Time Schedule.
- 9.4 Work Program: CONSULTANT shall within 21 (twenty one) days after the effective date of Contract furnish to Owner for approval a detailed work program showing how CONSULTANT proposes to perform the Work in accordance with the Time Schedule of Work (incorporating but not limited to all Milestones and Milestone tasks to complete the work within the specified time).
- 9.5 Approval of Program: Owner shall, within 21 (twenty one) days of receipt of such program (as provided under Clause 9.4), notify CONSULTANT in writing that the work program is approved with or without modification. If any modifications are made by the Owner, the Consultant shall treat such modified work program as final.
- 9.6 The Owner and CONSULTANT shall thereafter settle such work program and such settled program signed on behalf of the Owner & CONSULTANT shall constitute time schedule of Work (“**Time Schedule**”) for the purpose of the Contract.
- 9.7 Priority of Work: CONSULTANT shall give the Work the highest priority and no other work of CONSULTANT shall take precedence over the Work, nor shall CONSULTANT make any allocation of its resources which would have the effect of delaying the timely performance of the Work.
- 9.8 Maintenance of Schedule of Work: If CONSULTANT is not performing the Work at a rate which will maintain the Schedule of Work, CONSULTANT shall, at its expense and without entitlement to any additional compensation, cause CONSULTANT'S personnel to work such overtime and/ or shall provide such additional personnel and other resources & inputs/ materials as may be required to comply with the Schedule of Work.
- 9.9 Adjustments of Schedule of Work: Time Schedule of Work shall be adjusted only:
- i) by an extension of time granted by the Owner or
 - ii) when the Parties otherwise agree in writing that the Time Schedule of Work should be extended or accelerated.
- 9.10 The time of completion of the Project as specified in the contract is the essence. The time for performance/completion of contractors will be duly covered along with applicable liability clause in the contracts and Consultant shall maintain adequate follow-up/generation of documentation to monitor the Contractor's progress and assist OWNER in claiming the liability/damages as per the contracts.

10. PRICE FORMAT

- 10.1 Lump sum fee for the Work and other charges covered in the Tender document shall be quoted by the Consultant as per the Price schedule format attached as **Appendix –1** to the Special Conditions of Contract, which shall be inclusive of all kinds of expenses of travel, living, know-how, taxes, duties, incidental expense etc.
- 10.2 Amounts Included in the Contract Price: Except as hereinafter otherwise specifically provided, the contract price is inclusive of any and all duties and taxes & other levies, current, payable on such contract price in India or in any other country (except GST) and shall remain fixed and firm for the performance of all services by the CONSULTANT.

Special Conditions of Contract - Tender Ref. No. 1000440719

- 10.3 The quoted prices shall be inclusive of all applicable taxes, duties and other levies except Goods and Service Tax which shall be quoted separately and payable against proper invoice, in the prescribed format, in triplicate, indicating GST registration number and category of service. Bidders shall furnish the present rates of Goods and service tax as applicable.
- 10.4 Any statutory variation in duties/ GST, within the contractual completion period, shall be on OWNER's account, against submission of documentary evidence for substantiating the variation by way of relevant notification. However, in case of delay in completion period beyond the contractual date, for reasons solely attributable to Consultant, any increase in these rates shall be borne by the Consultant, whereas any decrease shall be passed on to the OWNER. OWNER shall take Input Tax Credit on Goods and Service Tax as per the relevant statutes in force. Consultant in turn shall be required to submit Input Tax Credit on Goods and Service Tax documents for the purpose of taking credit.
- 10.5 Any new or additional taxes, duties or levies imposed during the contractual completion period shall be paid to Consultant on submission of documentary proof. Further, in case of delay in completion of work, due to reasons attributable to Consultant, any new or additional taxes, duties or levies imposed after the contractual completion date shall be to Consultant's account.
- 10.6 Deleted
- 10.7 For visit to foreign nations (other than India) for visiting Licensor, supplier, Package Contractors etc. for services such as meeting with Licensor for review, follow up, review and expediting with suppliers, PACKAGE contractors etc. as desired by Owner, the Owner shall reimburse the man-day rates, all travel and accommodation expenses as per **Appendix -1 to SCC**. Consultant to quote their man-day charges in the prescribed proforma.
- 10.8 Since the anticipated Input Tax Credit (ITC) against expenditure incurred for the Project and propylene facilities are different, Owner will require separate invoices against jobs carried out in above two areas. The successful bidder shall submit the invoice accordingly.

11. ESCALATION

The price quoted shall be firm without any variation up to another 18 (Eighteen) months from the date of contractual completion of the Project. In case the actual completion extends beyond the stipulated date (18 (Eighteen) months from the date of contractual completion of the project) for reasons not attributable to Consultant, Consultant shall be entitled to an escalation on the quoted man-day and man-month (entitled as per Preamble for Man month rates) rates as specified below:

Base rate will be 18 (Eighteen) months from the date of Contractual Completion. Escalation will be calculated based on % change in "Consumer Price Index (CPI) Numbers for Industrial Workers - All India", published by the Reserve Bank of India between the above date and the date of actual services.

Lumpsum price other than reimbursable Man-day/Man-Month efforts shall remain firm till completion without any escalation.

12. TERMS OF PAYMENT

12.1 TERMS OF PAYMENT FOR LUMP SUM PART

The payment against the Lumpsum part of the job shall be effected based on completion of a set of milestones as listed in table below

Table: List of milestones to be considered for payment under Lumpsum part of job

Item no.	Description of Milestone Activities	% Break up of Lumpsum price
1	Conducting kick off meeting with BPCL, Submission of Consultant's organizational structure for site as well as design office, release of project document control procedure, co-ordination procedure, overall	0.5 %

Special Conditions of Contract - Tender Ref. No. 1000440719

	project management plan, activity weighing basis and draft project schedule.	
2	Submission of updated Engineering Design Basis pro-rata basis.	0.5%
3	Upon conducting P&ID review and Submission of updated and finalized BDEP / FEED for Licensed Units pro-rata basis.	1 %
4	Upon conducting P&ID review and Submission of updated and finalized BDEP / FEED for open art Units pro-rata basis.	1%
5	Upon conducting P&ID review and Submission of updated and finalized BDEP for Utilities & Offsites pro-rata basis.	1%
6	Upon conducting Hazop and SIL Review for Licensed, Open Art units & Utilities & Offsites and Submission of Hazop reports pro-rata basis.	1%
7	Submission of updated and finalized Plot Plan / Equipment Layout for PRFCCU- PRU (Part) Block	1%
8	Submission of updated and finalized Plot Plan / Equipment Layout for ARU-Caustic Merox -PTU Block	1%
9	Estimation, pre-qualification, bid preparation, tendering, floating of tender and submission of final award recommendation for PRFCCU RR Package.	1 %
10	Estimation, pre-qualification, bid preparation, tendering, floating of tender and submission of final award recommendation for PRFCCU COB, PRT Package Pro-rata basis.	1%
11	Estimation, pre-qualification, bid preparation, tendering, floating of tender and submission of final award recommendation for PRFCCU WGS, CT, C3 Mix Bullets package Pro-rata basis.	1%
12	Estimation, pre-qualification, bid preparation, tendering, floating of tender and submission of final award recommendation for PRFCCU MAB, WGC Package Pro-rata basis	1%
13	Estimation, pre-qualification, bid preparation, tendering, floating of tender and submission of final award recommendation for PRFCCU SRR, CR, SS Pro-rata basis.	1%
14	Estimation, pre-qualification, bid preparation and tendering of LLIs / Other Packages, floating of tender and submission of final award recommendation for LLI / other packages pro-rata basis-PRFCCU-PRU (Part) Unit.	3%
15	Estimation, pre-qualification, bid preparation and tendering of LLIs / other packages, floating of tender and submission of final award recommendation for LLI / other packages pro-rata basis-ARU-Caustic Merox -PTU-SWS Unit.	1%
16	Submission of updated and finalized plot plan / equipment layout for Utilities & Offsites pro-rata basis.	1%
17	Development of project 3D model (preliminary, 30%, 60%, 90%) pro-rata basis.	3 %
18	Progressively releasing of Bulk MTO's (30%, 60%, 90%) pro rata basis	3%
19	Based on progress of the Consultant's engineering & procurement services on monthly basis.	28%
20	Upon completion of fabrication & erection of major jobs of reactor regenerator package contract and plot (Rest of RR Package area) clearance for commencement of civil, UG & Structural Package 2.	2%
21	Based on plant physical / construction progress at site on monthly basis.	32 %

Special Conditions of Contract - Tender Ref. No. 1000440719

22	Mechanical Completion of all project facilities, pro rata basis	5 %
23	Pre commissioning, Startup and Commissioning Completion	2%
24	Submission of all documents (all as built drawings, final vendor datasheets for all equipment, all other documents required by owner for operation purpose)	2%
25	On Order / Contract Closure	2%
26	Completion of warehouse activities including handing over of project surplus	2%
27	Performance Guarantee Test Run	2%
	Total	100%

Note-

- 1) Further detailed break-up of the Milestones as indicated in the table above (% of the Milestone and the amount) and detailed billing break up based on the same shall be submitted by the successful bidder for approval of OWNER after the award of work.
- 2) The CONSULTANT has to interact/visit all Licensors and other Consultants/ suppliers/ package vendors for the project. All expenses in connection with such interactions/visit with agencies stated above in India including travel, accommodation etc. shall be part of Lumpsum Price in **Appendix 1** to SCC. For visit to licensors/ Consultants/ package vendors/suppliers etc. to foreign countries (other than India), the Owner shall reimburse the per-diem rates, all travel and living expenses as per **Appendix 1** to SCC.
- 3) 100% Payment will be released immediately post submission of invoices duly certified by BPCL Engineer – in charge. Deductions, penalties, recoveries, if any as applicable, shall be deducted from the payment.

12.2 TERMS OF PAYMENT FOR OTHER ITEMS

- Man-month rates for period beyond contractual completion period for construction management, assistance for Pre-Commissioning / Commissioning / Start Up/ PGTR-Form 2: on monthly basis based on the certification of Owner's engineer-in-charge post time extension approval from BPCL's competent authority.
- Man-month rates for doing additional services/extra jobs (if any)-Form 2: after completion of the job based on certification of owner's engineer-in-charge
- Man day rates for visit to foreign countries (other than India)-Form 3: after completion of the visit based on the certification of Owner's engineer-in-charge
- Man day rates for doing additional services/extra jobs (if any)-Form 3: after completion of the job based on certification of owner's engineer-in-charge.
- 100% Payment will be released immediately post submission of invoices duly certified by BPCL Engineer – in charge. Deductions, penalties, recoveries, if any as applicable, shall be deducted from the payment.

13. CURRENCIES OF PAYMENT

Payment to the Indian Consultant shall be made in Indian Rupees only. For foreign consultant quoting in USD/ EURO, payment shall be made in the respective quoted currency.

All cost figures shall be quoted in numerals as well as words.

14. COMPENSATION FOR DELAY("CD")

- 14.1 The scope of services shall be completed as per the time schedule and to the full satisfaction of OWNER and in case the Consultant fails to achieve the Mechanical Completion within the

Special Conditions of Contract - Tender Ref. No. 1000440719

stipulated period, for reasons attributable to the Consultant, they shall be liable to pay CD of 0.5% (Point five percent) of the lump sum fee of contract price per week of delay subject to a maximum of 5% (five percent) of the lump sum fee of contract price. The parties agree that this is a genuine pre-estimate of the loss/damage which will be suffered by the Owner on account of delay on the part of the Consultant and the said amount will be payable on demand without there being any proof of the actual loss or damages having been caused by such delay. The Owner shall be at liberty to adjust or deduct the said amount of CD from any amount due to the consultant or from the Security Deposit. In case where the concluded contract value (lumpsum fee) is different from the original contract value (lump sum fee) due to the change orders, the concluded contract value (lump sum fee) should be considered for recovery of price reduction for delayed completion.

14.2 Deleted

14.3 PRICE REDUCTION FOR SAFETY VIOLATION

CONSULTANT shall be responsible for ensuring adherence of all safety requirements by contractors under their Scope of Work carried out inside MR premises/facilities. In addition to price reduction and deductions as provided for in the Contract, the OWNER shall be entitled to deduct from any payment due to the CONSULTANT or adjust or deduct the said amount of price reduction from any amount due to the consultant or from the Security Deposit, for violations of safety provisions by the CONSULTANT, as per details given below:

Violation of applicable safety, health and environment related norm, resulting in:

- a) Any reportable physical injury to CONSULTANT's Personnel, as per Factories Act 1948, a price reduction of 0.5% of the Lump-sum Price (maximum of Rs. 1,00,000/-) per injury.
- b) Fatal accident to CONSULTANT's Personnel, a price reduction of 1% of the Lump-sum Price (maximum of Rs. 5,00,000/-) per fatality.

For other penalties related to violation of safety norms while executing the job, please refer the document **"FINANCIAL DETERRENT FOR VIOLATION OF SAFETY NORMS BY CONTRACTORS"** enclosed with the tender.

15. SECURITY DEPOSIT

- 15.1 The Consultant shall be required to give a Performance Security Deposit as per Article 18 of General Conditions of Contract ("**Security Deposit**").
- 15.2 BPCL shall retain the Security Deposit until the submission of Performance Bank Guarantee (as per Article 18 of the GCC).
- 15.3 The Security Deposit will be forfeited if the Consultant does not fulfill his contractual obligations with respect to defect liability or under circumstances set out in clause 14 above.
- 15.4 Contract Performance Bank Guarantee ("**BG**") to the extent of 5 % (Five percent) of the lump sum Price excluding tax shall be furnished by the Consultant from a nationalized/scheduled Indian Bank within 15(fifteen) days of issue of letter of acceptance. The BG shall be kept valid for a period of 3 months after the expiry of Defect Liability Period of the project which shall be calculated as per clause 19.7.1. In case of upward variation in contract value, additional security deposit commensurate with the variation amount shall be submitted.

16. CUSTOMS DUTY

In case the Consultant proposes to import any equipment, software, etc. for the purpose of performance of the job in India, all duties related to such imports shall be paid directly by the CONSULTANT to the concerned authorities and the same shall be included in the lump sum quoted price. The Owner will not bear any liability on this account. It is the responsibility of the CONSULTANT to provide the required particulars and documents to the customs and other

Special Conditions of Contract - Tender Ref. No. 1000440719

government authorities and get the materials cleared and transported in time. Consultant shall be fully responsible for any delays, penalties, charges, losses, if any in this regard.

17. TAXATION

17.1 In the case of indigenous consultant, taxation clauses will be as per GCC

17.2 In the case of foreign Consultant, the fees/ costs quoted shall be inclusive of all non-Indian taxes. Further, all taxes (including withholding tax), assessments and other charges assessed or imposed by the Government of India or any other government authority in India which Consultant, Consultant's personnel is required to pay in connection with this Contract or any goods or services provided by Consultant under this Contract shall be borne by the Consultant.

17.3 Income tax/withholding tax at the prevailing rate shall be deducted from Consultant's bill as per Indian Income Tax Act, 1961. Tax deduction certificate shall be issued by Owner.

All Consultant are required to provide Permanent Account Number along with the bid while quoting. The withholding rate applicable for Consultant without PAN will be as per the prevailing rates.

17.4 Any fine, penalty or levies, required to be met by the BPCL, arising out of non-compliance with respect to Indian taxation provisions by Consultant, Consultant's personnel shall be recovered from amounts payable to Consultant.

17.5 All Foreign bidders shall submit the necessary documents as and when required for enabling payment. The documents required as per present governmental norms are:

- (i) PAN Number
- (ii) Certificate of not having permanent establishment in India within the purview of treaty, if applicable.
- (iii) Tax Residency Certificate
- (iv) Revised Form 10 F

18. ADHERENCE TO GOVERNMENT GUIDELINES

Owner being a Public Sector Undertaking under the Government of India, may be required to modify / delete / add any clauses to this Contract to comply with the guidelines / directions issued from time to time by the Government / other authorities. The Consultant agrees to be bound by such modifications, deletions, additions and undertakes to execute such instruments, deeds and documents that may be necessary to give effect thereto.

All statutory requirements such as OISD guidelines, etc. are to be strictly adhered to in the design, Engineering and execution.

19. WARRANTIES, GUARANTEES:

19.1 GENERAL WARRANTIES:

CONSULTANT warrants that:

19.1.1 Personnel: All professional personnel of CONSULTANT shall have proper qualifications for the Work assigned to them hereunder.

19.1.2 Standard of Care and Work: CONSULTANT shall perform their obligations under this Contract in conformity with the international standards of care employed by leading engineering firms in the petroleum refining, petrochemicals and pipeline industry and all Work shall be of high standard.

19.1.3 Management, Design and Development: The management, design and development of the Work shall conform to this Contract and shall be free of defects and deficiencies. The management, design and development shall be such that the Work shall comply with the terms

Special Conditions of Contract - Tender Ref. No. 1000440719

of this Contract and shall meet all design, safety and performance and other criteria as specified herein.

- 19.1.4 **Other Services:** All Work performed by CONSULTANT not otherwise mentioned in this Clause, including, without limitation, inspections performed by CONSULTANT under this Contract, shall be adequate and sufficient for the purposes specified, in conformity with the terms of this Contract and free of defects and deficiencies.

CONSULTANT'S obligation to manage, design and develop the Work correctly and the general warranties set forth above, shall not be reduced or affected by any inspection, test, acceptance or payment or by the issue of the Certificate of Acceptance of the Work or any re-performance or replacement of any part of the Work.

19.2 GENERAL GUARANTEES:

- 19.2.1 **CONSULTANT** shall guarantee that the Work as specified and described in this bid document and technical documents to be developed shall be in accordance with sound and established engineering practices using international standards and Indian codes and regulations, wherever applicable, for the purpose specified, free from defects/faults and suitable for respective uses as intended.

- 19.2.2 **FAULTY ENGINEERING** In the event of faulty or defective design/ engineering of the PLANT/UNIT and/ or faulty approval of design(s), drawing(s) and specifications, including error or omission in the technical services or studies done, undertaken or performed by CONSULTANT within the scope of WORK, CONSULTANT shall promptly and at its own cost and initiative carry out and undertake corrective studies, design(s), drawing(s) and engineering as may be necessary to rectify the fault or defect without any additional cost to the OWNER and to the Owner's satisfaction. However, no such liability shall lie after expiry of Defect Liability Period, if the performance guarantees have been met.

- 19.2.3 **SURPLUS MATERIAL:** CONSULTANT shall, at the detailed engineering and procurement stages make due efforts to minimize the generation of surplus materials during execution of the PROJECT. On contractual completion, CONSULTANT shall ensure that the cost of the total surplus bulk materials does not exceed 3% (three Percent) of the total cost of bulk materials. Cost of bulk materials shall mean total cost of bulk materials as listed in 'Technical Section-Scope of Work' of this Tender document. The calculation of surplus bulk materials shall be made after giving due allowance for standard spares, mandatory & commissioning spares and wastage which will be decided mutually during design/engineering stage. However surplus materials generated due to changes suggested by licensor and BPCL shall be excluded from the list of surplus bulk material suggested in this clause. Also, surplus calculation excludes excess bulk spare procurement philosophy agreed between Consultant and Owner. Further Consultant will assist BPCL in transferring of the entire surplus material generated to internal/external agencies within reasonable time to the designated location.

- 19.2.4 **MECHANICAL:** For the benefit of OWNER, CONSULTANT shall include in purchase orders and Work contracts a requirement for guarantees from equipment/ materials Vendors and Contractors against defects in materials, workmanship & Mechanical Performance Guarantees wherever applicable and shall assist OWNER in the enforcement of such guarantees. However, CONSULTANT shall not be required to enter into any litigation with Vendors/ Contractors on behalf of OWNER.

19.2.5 PERFORMANCE GUARANTEE

The CONSULTANT shall be responsible for PLANT performance guarantees in terms of product quality and rated capacity including turn down capacity of each Unit and/ or facility and/ or systems resulting from EPCM /Package mode implementation activity as per this agreement so far as they relate to or depend upon or arise out of any residual process design,

Special Conditions of Contract - Tender Ref. No. 1000440719

hazop study performed and/ or done and/ or designs, drawings and/ or specifications furnished or approved by the CONSULTANT and to detailed engineering or other work performed, done or approved by the CONSULTANT. The guarantees shall also cover mechanical performance guarantees for related equipment efficiencies and their performance as laid down in the Process Package. The guarantee shall also cover performance of the measurement and control systems as a whole. Failure to meet the performance guarantees, including under-performance of any equipment shall, subject to the provisions of clause 19.2.4 hereof, be made good by the CONSULTANT by alteration, replacement or repair (including hook-up, testing and commissioning) as necessary at no extra cost to the OWNER. Although the CONSULTANT is not responsible for process guarantees for the process units of the PROCESS LICENSOR/ PROCESS DESIGNERS, but hydraulic guarantee to be provided by Consultant. The CONSULTANT shall conduct all activities necessary for collecting required data during guarantee performance test runs of these units/ facilities to identify problems of non-performance for further analysis and modifications required to meet process performance parameters.

19.3 START-UP AND COMMISSIONING

19.3.1 Deleted

19.3.2 The Unit(s) shall be started up and commissioned by the OWNER under the technical direction of Licensor(s)/ Process Designers and along with OWNER'S and CONSULTANT'S designated representative in accordance with Licensor(s)/ Process Designers procedure for units/facilities for which process design is done by Licensor(s)/ Process Designers/CONSULTANT/PACKAGE contractor.

19.3.3 After completion of erection and prior to startup of the Unit/Facility, OWNER, Licensor(s)/Process Designer(s) and CONSULTANT representatives will inspect the Unit/facility as well as individual plant equipment as to their being erected in accordance with the requirements and as to their readiness for Start-Up in all respects including process requirements. Without prejudice to the responsibilities of the Licensor(s)/Process Designer(s), the responsibility for correctness of the Plant will also lie with the CONSULTANT. All modifications required for safe and smooth startup of the plants and facilities will be incorporated by CONSULTANT in their detail engineering and will be implemented before commissioning.

19.3.4 In course of such an inspection, OWNER, Licensor(s)/ Process Designer(s) and CONSULTANT'S representative shall indicate in writing those adjustments, alternations and/ or repair relating to the Unit/ facility and individual plant/ equipment as it deems necessary for start-up, commissioning and performance test run and such adjustments, alterations, and/ or repairs shall be immediately arranged to be carried out by OWNER/ CONSULTANT as part of Start-Up operation at OWNER'S cost. The time required for these adjustments, alterations and/ or repairs shall be mutually agreed between the CONSULTANT & OWNER.

19.3.5 CONSULTANT shall submit list of systems and prepare list of pre-commissioning activities to be performed for all applicable disciplines against each system, including flushing schemes for piping sub-systems. These documents shall be prepared, discussed and submitted to owner at least 90 (ninety) days before Start Up Pre-Commissioning activities for all the facilities.

19.3.6 Requisite documentation formats and procedures for carrying out Pre- Commissioning Start Up and Commissioning activities will be firmed up with owner in line with pre-commissioning schedule requirements.

19.3.7 OWNER will arrange their own operating manpower as required for commissioning of Process units such as;

- * Commissioning Co-ordinator
- * Shift In-charge

Special Conditions of Contract - Tender Ref. No. 1000440719

- * Control Room Coordinator
- * Field Supervisors
- * Trained Operators
- * Licensor's Representatives

CONSULTANT shall arrange the Vendor representatives required for Commissioning, as per purchase order terms.

19.4 PERFORMANCE TEST FOR EACH UNIT

- 19.4.1 For the purpose to demonstrate that the UNIT meets **CONSULTANT'S** guarantees according to Clause 19.2, one or more performance tests shall be carried out for a maximum of 120 hours each under the technical direction of **LICENSOR/OWNER** and or their designated representatives after commissioning the plant in accordance with the procedure and on conditions as set forth hereunder. At the end of the performance test an uninterrupted period of 72 hours shall be selected by **CONSULTANT** in consultation with **OWNER** and the average results obtained during that period shall form the basis of comparison between the actual performance and guaranteed performance as per Clause 19.2.
- 19.4.2 The exact date of the Performance Test shall be mutually agreed upon between **CONSULTANT** and **OWNER**. PGTR is to be completed within 6 (six) months after commissioning.
- 19.4.3 The performance test shall be carried out in accordance with a detailed technical program to be drawn up by **CONSULTANT**, which shall be discussed and finalized in consultation with **OWNER** prior to the commencement of the performance test.
- 19.4.4 The performance test shall be conducted under normal operating conditions. Wherever standby equipment and/ or machinery have been provided, the standby capacity will not be utilized.
- 19.4.5 Measuring method of tolerances and the instrument for analysis shall be as per accepted practices and shall be mutually agreed upon before the start of the performance test.
- 19.4.6 In case the first performance test fails to meet **CONSULTANT'S** guarantees as per Clause 19.2 the authorized representatives of **CONSULTANT** and **OWNER** shall mutually discuss and determine the causes of failure of the test. Necessary modifications required will be suggested by **CONSULTANT** in writing and **OWNER** shall arrange to carry out these modifications in a time to be agreed upon mutually between **CONSULTANT** and **OWNER**. **CONSULTANT** and **OWNER** shall mutually establish a date by which the second performance test can be commenced after the modification. If required, a third performance test or more will be mutually decided.
- 19.4.7 Within five days after completion of a performance test, all relevant operating and production figures having any bearing on **CONSULTANT'S** guarantees or in connection therewith and actually achieved during the performance test conducted shall be recorded in a protocol to be signed by authorized representatives of **CONSULTANT** and **OWNER**.
- 19.4.8 **CONSULTANT'S** guarantees according to Clause 19.2 are deemed to have been met and pursuant thereto **CONSULTANT'S** obligations under this CONTRACT are deemed to be fully completed in respect of the UNIT once all guarantee figures according to Clause 19.2 have been established during one or more performance tests carried out as above.
- 19.4.9 Conditions Of Guarantee: During the course of initial start-up, trial runs and in between successive performance tests, **OWNER** shall make such modifications to the facilities as may be requested in writing by **CONSULTANT/Process Licensor(s)/Process Designer(s)** for overcoming any defects and/or deficiencies affecting the performance of the facilities. **OWNER** and **CONSULTANT** in consultation with **Process Licensor(s)/Process Designer(s)**, where relevant, shall mutually agree to a time schedule for such modifications to be arranged through **Contractors/ Vendors**.

19.5 LIABILITIES FOR PERFORMANCE GUARANTEES

- 19.5.1 If the performance guarantees as per Clause 19.2 above are not met during any performance test(s), CONSULTANT may recommend to OWNER items of redesign, change or modification in the process unit or operating conditions. Any such design change/modification/change in operating condition shall be subject to Licensor's approval. CONSULTANT will, at its own expense, provide corrective engineering designs to effect such redesign, change or modification, if the reasons for the same are attributable to the CONSULTANT.
- 19.5.2 If the OWNER agrees to incorporate the items of redesign, change or modification suggested by CONSULTANT, the performance tests shall be repeated after incorporation of such changes or modifications.
- 19.6 Deleted

19.7 GUARANTEE/ DEFECT LIABILITY PERIOD

- 19.7.1 CONSULTANT'S guarantees shall be valid up to a period of 12 (twelve) months from the date of commissioning of the PROJECT or 18 months from Mechanical completion, whichever is earlier (the “**Defect Liability Period**”).
- 19.7.2 The process performance guarantees wherever applicable will be demonstrated in the performance test runs conducted in accordance with Clauses mentioned above. After demonstration of the performance test run, CONSULTANT will not be required to re-demonstrate such test runs during the Defect Liability Period and all obligations of CONSULTANT with respect to process performance guarantees shall be deemed to have been fulfilled upon such successful performance test run. This is however, without prejudice to the obligations of the CONSULTANT in respect of other guarantees.
- 19.7.3 In case of correction work done by the EPCM/PACKAGE contractor or Process licensor during the Defect Liability Period, the CONSULTANT shall assist the OWNER with such services as may be required by the OWNER.

20 DOCUMENTATION

20.1 Documents for Approval/Review, Comments

The documents required to be submitted to OWNER/Licensor by CONSULTANT for the purpose of approval or review/comments as mentioned against each item is given in ‘Technical Section- Scope of Work’ of this tender document. One copy of such documents shall be returned to CONSULTANT after making OWNER'S comments. For only those documents requiring approval, three copies will be re-submitted to OWNER after incorporating the comments. Out of them, one copy will be signed and returned to CONSULTANT as an approved document, within two weeks of submission. In case the documents are of such nature as requiring discussion/redrafting for the purpose of consideration for approval, CONSULTANT/OWNER shall organize meetings within two weeks of submission of draft document so that the comments can be finalized during such meeting. Soft copies of documents, editable format (in MS Word/Excel/AutoCad/PowerPoint) shall be submitted in native form with all formulas to OWNER.

20.2 Documents for Information

Documents given in ‘Technical Section- Scope of Work’ of this Tender document, as applicable, will be submitted to OWNER as and when generated, for information.

20.3 Final Documents

Documents given in ‘Technical Section- Scope of Work’ of this Tender document (as applicable) will be submitted to OWNER as final documents (Properly bound & indexed in order & volumes)

Special Conditions of Contract - Tender Ref. No. 1000440719

21 CONSULTANT 'S WORK AND RESPONSIBILITIES

- 21.1 The WORK: CONSULTANT shall perform all activities mentioned under 'Scope of Work'.
- 21.2 Additional Responsibilities: Except as may otherwise be specifically provided in this Contract, CONSULTANT shall be responsible to provide managerial, design and engineering services and labour, and all incidental inputs/Materials and any other items not specifically described in this Contract if:
- a) it reasonably may be inferred in accordance with standards employed by leading engineering firms in the Oil Refining/Petrochemical industry that the provision of such additional items was contemplated by or as part of this Contract and/or the Project management, and /or otherwise in relation to any aspects of the WORK; or
 - b) The provision of such additional items is necessary in order for CONSULTANT to satisfy the warranties and guarantees set forth in Clause 19.0 and/or to otherwise make the WORK comply with this Contract.

WORK undertaken and inputs/ Materials and additional items provided pursuant to this clause shall be deemed to have been included within the Contract Price and shall not give rise to any adjustment in Contract Price.

- 21.3 Special Requirements: CONSULTANT shall develop quality assurance philosophy, the health, safety and environmental requirements and the document control requirements etc.
- 21.4 Local Law: CONSULTANT will be responsible for obtaining all information relating to laws, regulations and ordinances, including safety and environmental regulations, in India and applicable to the performance of CONSULTANT'S obligations hereunder including fulfillment of its requirements.
- 21.5 Labour Laws: As Engineer-in-Charge of all the Contracts & representative of the OWNER, CONSULTANT shall be fully responsible for compliance of various applicable Labour Laws including Contract Labour (Regulation & Abolition) Act, 1970, Contract Labour (Regulation & Abolition) Central Rules 1971, Employees Provident Fund and Miscellaneous Provisions Act, 1952 and the Employees State Insurance Act, 1948 as amended from time to time. CONSULTANT'S responsibility in this regard shall also include wage/attendance certification, witnessing of labour payments, certification of PF/ ESI challans etc. engaged by BIDDER directly.
- 21.6 Permits and Licenses: CONSULTANT will provide all technical and managerial assistance sought by Owner to obtain and maintain any registrations, licenses (including import licenses for or in relation to Work) and permits which are required by any applicable Indian laws or regulations and which are required to be in the name of Owner or its employees or agents.

22 CONSULTANT 'S ACCEPTANCE OF THE WORK

Acceptance of the Work: CONSULTANT acknowledges that it has entered into this Contract for the consideration set forth herein and that CONSULTANT has carefully examined and satisfied itself in respect of all pertinent matters which may bear upon the performance of the Work, the calculation of the Contract Price and the determination of the Schedule of Work, including, without limitation, the quality and quantity of the personnel, resources, inputs and Materials required for the performance of the Work, the availability of labor and personnel for such performance, the character and quality of the Work to be performed, the location or locations where the Work is to be performed and any and all other pertinent matters and conditions.

- 22.1 Information Provided by Owner: The design information and any other information supplied, prepared or commissioned at any time by Owner including the Owner's representative(s) in connection with this WORK is being provided in good faith. CONSULTANT shall exercise its

Special Conditions of Contract - Tender Ref. No. 1000440719

knowledge and competence in scrutinizing and evaluating such information and shall proceed with use of such information only after satisfying itself of its sufficiency for use.

23 STANDARDS OF PERFORMANCE

In performing the Work, CONSULTANT shall conform in all respects to the standards of performance set forth in the Contract.

23.1 Professional Performance: CONSULTANT shall perform the Work in a professional manner, using sound engineering and design principles and management and supervisory procedures, and in accordance with the standards employed by leading international engineering firms in the petroleum refining/Petrochemical industry. CONSULTANT represents that it has the required skills and capacity to perform the Work in the foregoing manner.

23.2 Management, Design and Engineering

23.2.1 All Work shall be performed and executed by the CONSULTANT in strict conformity with the requirements of this Contract, including, without limitation, the Scope of Work.

23.2.2 CONSULTANT shall submit to Owner for approval, within the time periods specified in this Contract or in the absence of any specified periods within periods specified by Owner, such documents, write-ups, designs, drawings, samples, patterns, models and manuals as may be specified in this Contract, or as may be reasonably required in order to enable Owner to approve the Work and the Project management. Owner shall signify its approval or disapproval. CONSULTANT shall be responsible for any discrepancies, errors, or omissions in the documents and other particulars supplied by it whether or not such documents and particulars have been approved by Owner. CONSULTANT shall not depart from the approved documents, drawings, samples, patterns, models or manuals except as directed in writing by Owner.

23.2.3 The Owner shall be entitled at any time to suggest any amendments/modification(s) in the plans/ designs/ drawings and the CONSULTANT shall thereupon either convince the Owner that such amendment/modification are unnecessary in whole or part or shall implement the same and shall cause the plans/ drawings/ designs to be accordingly amended; provided that no such approval of or amendments/modifications in the plans/ drawings/ designs suggested by the Owner shall anyway absolve CONSULTANT of any of his obligations, responsibilities or liabilities under the contract, inclusive of and relative to the utility and suitability of the CONSULTANT plans/ drawings/ designs in the relative work and the fulfillment of all specifications and performance guarantees of the consequent work, any such approval or suggestion by Owner as aforesaid being intended only by way of assistance to the CONSULTANT without any attendant liability upon the Owner.

In the event Owner makes/suggest any changes after their approval, Owner shall provide in principle approval for the same based on which Consultant shall start the work. The time and cost impact of implementing it shall be mutually agreed within 30 (thirty) days of the approval.

23.2.4 CONSULTANT shall not permit any Work to be done, at variance with drawings/ designs approved by the Owner and/ or amended or modified as aforesaid or otherwise in terms of the Contract.

23.3 Provision of Service

23.3.1 General: Except for items required to be provided by Owner pursuant to this Contract, CONSULTANT shall provide all services (including services of others), supplies and utilities, required for the design and performance of the WORK and all inputs, resources and material required for or in or incidental to the performance thereof.

23.3.2 Compliance with Codes and Standards: CONSULTANT agrees that the Work and all systems, components and parts of the Work shall comply with:

Special Conditions of Contract - Tender Ref. No. 1000440719

- (i) Those design criteria, codes and standards which are specified in this Contract, Scope of Work and as agreed between CONSULTANT and Owner; and
- (ii) The requirements of all relevant Indian authorities, including without limitation:
 - a) Factories Act;
 - b) Indian Petroleum Rules;
 - c) Tariff Advisory Committee Guidelines;
 - d) Liquid effluent discharge, as per Minimal National Standards for liquid effluents and air emissions conforming to Pollution Control Board Standards;
 - e) Civil Aviation Rules;
 - f) Indian Boiler Regulation Act;
 - g) India Electricity Rules; and
 - h) Requirement of Chief Controller of Explosives (PESO)
 - i) Requirements of other authorities concerned with the Project or out of any license, permission, sanction, approval or no objection relative thereto.
 - j) OISD (Oil Industry Safety Directorate) requirements
 - k) CEA (Central Electrical Authority)
 - l) Legal Metrology

CONSULTANT also agrees that all design criteria, codes and standards included in this Contract are and at all times prior to the Acceptance of the Work will be in compliance with the requirements of such authorities.

23.3.3 Any modification to agreed design criteria will be subject to CONSULTANT providing detailed justification and Owner's approval of the same.

23.4 Conduct of Work

Manufacturing Procedures: CONSULTANT shall perform, design and develop the Work in accordance with the latest practicable techniques and innovations consistent with the management, engineering and design of the Work and the Schedule of Work. CONSULTANT shall also perform the management, design and development to incorporate, consistent with the Schedule of Work, experience gained in the course of designing, developing and managing other similar work designed, developed and managed by CONSULTANT.

23.5 Compliance with Applicable Laws and Regulations:

CONSULTANT shall abide by all applicable laws, regulations and ordinances of all governmental authorities and of the administrative subdivisions thereof applicable to this Contract and the performance by CONSULTANT of the Work in any jurisdiction and by all rules and regulations of those Persons and entities having control or jurisdiction over the Work. CONSULTANT represents that it is fully aware of all of the legal requirements, business practices and rules and regulations, which must be followed when performing the Work, CONSULTANT shall furnish to Owner, promptly upon request, such information concerning CONSULTANT, their employees, servants and agents as Owner may be required to furnish to any applicable governmental or other agencies or authorities.

23.6 Permits and Licenses

23.6.1 In CONSULTANT'S Name: CONSULTANT shall obtain and maintain any registrations, licenses (including import and export licenses), and permits (including immigration, temporary residence, work and exit permits), which are required by Indian or other foreign laws, or Indian or other foreign regulations, for the performance of the Work and which are required to be in the name of CONSULTANT, its employees, or agents.

23.6.2 In Owner's Name: CONSULTANT shall assist Owner in obtaining and maintaining (including the preparation and submission to Owner of all

Special Conditions of Contract - Tender Ref. No. 1000440719

documentation necessary therefore), any non-Indian registrations, licenses and permits (including import and export licenses for the Work), which are required to be in the name of Owner or its employees or agents.

23.7 Cooperation with Process Licensors, Other Consultants, Contractors and Suppliers

CONSULTANT recognizes that other Consultants, process licensors, contractors and suppliers have been, and may be, engaged by Owner to advise Owner and to perform other services with regard to the Work, CONSULTANT shall cooperate with Owner's other Consultants, process licensors, contractors and suppliers, provide reasonable access to CONSULTANT'S premises for them and coordinate its activities with the activities of such Consultants, process licensors, contractors and suppliers under Owner's direction.

23.8 Notification of Suits and Claims; Owner's Right to Defend

23.8.1 CONSULTANT to Notify: CONSULTANT shall give Owner immediate written notice of any suit or action filed against CONSULTANT arising out of the performance of the Work, and of any claim against CONSULTANT which if paid could result in a claim by CONSULTANT for indemnification by the Owner. CONSULTANT shall promptly furnish to Owner copies of all papers received by CONSULTANT pertinent to any such suit or action.

23.9 Owner's Right to Defend: If requested by Owner, CONSULTANT shall do any and all things necessary or appropriate to effect an assignment and subrogation in favor of Owner of all CONSULTANT'S rights, except against Owner, arising from or growing out of any suit, action or claim referred to in Clause 23.8.1, and shall authorize Owner or Owner's designated representative(s) and/ or lawyer(s) to exercise any such rights to settle or defend any such claims or take charge of any such litigation affecting CONSULTANT. In the event of such a request by Owner, Owner shall reimburse CONSULTANT for the costs of such litigation incurred by CONSULTANT, if any, including judgments, settlements, court costs and, if Owner does not retain its own counsel, reasonable attorney's fees.

23.10 Conflicts of Interest; Commission Payments:

CONSULTANT represents and agrees that it has not paid any commission, fee, or other compensation, incentive, bribe or gratification for procuring this Contract and that no person or entity has been retained or employed to solicit this Contract upon any arrangement or understanding for the payment of any commission, fee or other compensation of any kind, except for payments to bonafide employees of CONSULTANT or bonafide commercial agencies maintained by CONSULTANT in connection with CONSULTANT'S business. CONSULTANT further represents that neither it nor any of its Affiliates nor any of their respective officers, directors, employees, have made, received, provided or offered any such commission, fee or compensation. CONSULTANT agrees that neither it nor any such other entity or person shall make, receive, provide or offer, any gift, entertainment, payment, loan or other consideration for the purpose of influencing the procurement of any contract or otherwise for the purpose of influencing any individual or organization to any course of conduct in any way relating to or affecting this Contract or any other contract contemplated within the Scope of Work. Breach of the foregoing warranties shall constitute a material breach of this Contract and shall give Owner the immediate right to terminate this Contract pursuant to Clause 36.0.

24 LIST OF MILESTONES

The bidder to submit the Schedule of Completion from Effective Date of the CONSULTANT Contract for the project activities. The bidder shall submit detailed Milestone List for OWNER'S approval based on the above.

25 RIGHT TO INSPECT

25.1 Inspection and Examination.

Special Conditions of Contract - Tender Ref. No. 1000440719

Owner, Owner's Representative/or Owner's designated consultants and/ or other representatives shall be entitled & all time to inspect, examine and test all management, design, development, Materials, Work and workmanship supplied by CONSULTANT or for which CONSULTANT is responsible during management, design and development and at any and all places where such management, design, development and/ or work is carried on, provided such inspection, examination and testing shall, to the extent possible, be carried out in conjunction with CONSULTANT 's similar activities and, if not, upon prior intimation to CONSULTANT. In furtherance of the foregoing, CONSULTANT shall arrange for Owner to have access to all places where design and development are being carried out. Under no circumstances shall CONSULTANT deny such access to Owner or Owner's representatives.

25.2 Rejection and Replacement

Owner and its designated representatives shall be entitled to reject at any time any portion of the Work, which is defective, deficient, not within specifications or otherwise of inferior quality or faulty workmanship and require its re-performance or replacement. Rejected and other defective or deficient management or workmanship shall be satisfactorily redone. The costs associated with such re-performance and replacements shall be for the account of CONSULTANT and not reimbursable. After completion of the necessary re-performance or replacements, the relevant Work shall be subject to further inspection and examination by Owner and representatives. If CONSULTANT fails to proceed at once with the correction or re-performance of defective management or workmanship, Owner may, by contract with third parties or otherwise, correct such management or workmanship or re-perform the Work and/ or may terminate this Contract pursuant to Clause 36. Such re-performance and/ or replacement of CONSULTANT'S work shall be Owner's exclusive remedy with respect to the quality of the Work.

25.3 CONSULTANT to Furnish Supplies and Services for Inspection:

CONSULTANT shall furnish at each location where inspection and examination is carried out pursuant to Clause 25.1 all reasonable facilities, assistance, labour and utilities necessary for the safe and convenient inspection of WORK that may be required pursuant to this Contract. CONSULTANT shall also furnish Owner and Owner's designated Consultants and representatives with access to records of all inspections undertaken by CONSULTANT. All inspections and examinations by Owner, or its designated Consultants and representatives shall be performed within reasonable time required for such inspection/ examination and in such manner as not unnecessarily to delay the WORK. Tests shall be conducted in accordance with applicable provisions of this Contract or otherwise as may be agreed between OWNER and CONSULTANT.

25.4 Inspection on behalf of Third Parties:

Third parties acting pursuant to the requirements of Indian authorities shall have the same rights of inspection and examination as are granted to Owner pursuant to this Article-25.

25.5 Consequences of Inspection or Failure to inspect:

The right of inspection and examination by Owner and by its designated Consultants and other representatives provided herein is intended solely for the Owner's benefit, it being understood that no exercise of or failure to exercise such right shall relieve CONSULTANT of any of its obligations hereunder or prejudice any of Owner's rights under this Contract.

25.6 Other inspection related conditions not specifically mentioned herewith shall be as per GCC.

26 ACCEPTANCE PROCEDURE

26.1 Notice of Acceptance:

Subject to Clause 26.2 CONSULTANT shall notify Owner in writing when CONSULTANT believes that it has completed the entire Scope of Work. Within 30 days after receipt of

Special Conditions of Contract - Tender Ref. No. 1000440719

CONSULTANT's notice of such completion of the Work, Owner shall advise CONSULTANT in writing of any portions of the Work which remain to be performed, and CONSULTANT shall thereupon complete such portions and again notify Owner in writing that CONSULTANT confirms that the Work has been completed. Within 30 (thirty) days after receipt from the CONSULTANT of each subsequent notice of completion of the Work, Owner shall advise CONSULTANT of any continuing or additional portions of the Work which remain to be performed. Owner shall issue a certificate of Acceptance of the Work (the "**Certificate of Acceptance**"), after the Work has been completed and accepted, and dated to reflect the actual date of Acceptance of the Work.

26.2 Conditions:

The Issue of the Certificate of Acceptance shall be conditional upon:

- (i) Legally effective releases, executed by CONSULTANT, and any persons claiming by, through, under or against CONSULTANT who might have an interest in the Work or part adverse to Owner, of all claims and liens against Owner arising under or by virtue of this Contract, except such claims and liens, if any, in such stated amounts which CONSULTANT, with the written consent of Owner, may exclude from the operation of such releases and
- (ii) CONSULTANT's written declaration, together with such supporting documents as Owner may reasonably require, that all claims and demands against, and debts incurred by CONSULTANT, in respect of this Contract, have been settled, except claims excluded with the consent of Owner from the releases referred to in the foregoing clause (i), and all taxes due and payable by CONSULTANT pursuant to or with reference to this contract have been paid or otherwise provided for.

26.3 Discretion of Owner:

Notwithstanding the foregoing, Owner, in its sole discretion, may accept part of the Work at any time and issue a Certificate of Acceptance even if, after corrective measures have been taken by CONSULTANT, the Work as a whole does not satisfy the requirements of this Contract. Such acceptance and such notice shall not relieve CONSULTANT of its obligations under this Contract unless:

- (i) For no fault of CONSULTANT Owner fails to give CONSULTANT access to the Work or part thereof to affect the requested or required corrections within 60 (sixty) calendar days of the date CONSULTANT makes written request; therefore, and
- (ii) CONSULTANT is ready, willing and able to perform such corrections within such period.

26.4 Cost of Corrections:

If CONSULTANT is required to correct any defects or deficiencies in the Work in connection with the issue of the Certificate of Acceptance of the Work pursuant to this Clause 26.0 or which result, from a breach of CONSULTANT's warranties and guarantees or otherwise in accordance with the terms of this Contract, the costs associated with the correction of such defects or deficiencies shall be for the sole account of CONSULTANT and shall not be reimbursable or payable to unit rates or otherwise.

Effect of Approvals, Acceptance & Payment

The obligations of CONSULTANT hereunder shall not, except as expressly provided herein, be reduced or affected by any inspection, test, approval or payment, whether preliminary or final, or by the Certificate of Acceptance of the Work, it being agreed that the obligations of CONSULTANT hereunder shall continue until fully satisfied.

26A Deleted

Special Conditions of Contract - Tender Ref. No. 1000440719

27 COMPLETION CERTIFICATE:

- 27.1 Within 7 (seven) days of issue of Certificate of Acceptance specified in Clause 26.1, CONSULTANT shall clear the job site of all surplus materials, CONSULTANT's labour, equipment and machinery and shall demolish, dismantle and remove all CONSULTANT's site offices and quarters and other temporary work, structures and constructions and other items and things whatsoever brought upon or erected at the job site or any land allotted to CONSULTANT by the Owner and not incorporated in the permanent work and shall clear, level and dress the job site to the satisfaction of the Owner's representative and shall put the Owner in undisputed custody of all land allotted by the Owner to CONSULTANT for the performance of this Contract and unless CONSULTANT shall have fulfilled the provisions of the clause, the Work shall not be deemed to have been completed.
- 27.2 Upon the satisfactory fulfillment by CONSULTANT of the provisions of Clause 26.0 thereof, CONSULTANT shall be entitled to apply to the Owner for a Completion Certificate in respect of the Work upon submission of the following documents:
- i) The technical documents according to which the Work was carried out;
 - ii) Complete set of working drawings showing therein corrections and modifications (if any) made during the course of execution of the Work.
 - i) Certificate of Acceptance.
 - ii) Certificate of the Owner's representative of satisfactory fulfillment of the provisions of Clause 39.1.
 - iii) List of Owner-supplied surplus materials (if any) returned to Owner's stores and materials-at-site accounting for Owner-supplied materials, signed by the Owner's representative; and
 - iv) Discharge Certificate in respect of Owner-supplied equipment and machinery signed by the Owner's representative.
- 27.3 If the Owner is satisfied of the completion of the Work and of the Documents specified above, the Owner shall within 15 (fifteen) days of the receipt of the application for Completion Certificate, issue Completion Certificate in respect of the Work to CONSULTANT.
- 27.4 The issue of a Completion Certificate shall be without prejudice to the Owner's rights and CONSULTANT'S liabilities under the Contract, including the CONSULTANT'S liability in respect of Process guarantees, Rectification & Defect Liability and Price Reduction, nor shall the issue of a Completion Certificate in respect of the Work be construed as a waiver of any right or claim of the Owner against CONSULTANT in respect of Work.

28 INSURANCE-

INSURANCE TO BE TAKEN OUT BY CONSULTANT:

During the performance of WORK hereunder, CONSULTANT shall take out, carry and maintain insurance as per industry practice including the following listed below:

- 28.1.1 Workman's compensation insurance, covering all employees of CONSULTANT and any other personnel of Consultant for statutory benefits as set out and required by law (Indian) in the area of operation or area in which CONSULTANT may become legally obliged to pay benefits for bodily injury or death.
- 28.1.2 The Consultant agrees to and does hereby accept full and exclusive liability for the compliance with all obligations imposed by the Employees State Insurance Act, 1948, and the Consultant further agrees to defend, indemnify and hold Owner harmless from any liability or penalty which may be imposed by the Central, State or Local Authority by reason of any asserted

Special Conditions of Contract - Tender Ref. No. 1000440719

violation by Consultant, of the Employee State Act, 1948 and also from all claims suits or proceedings that may be brought against the Owner arising under, growing out of or by reason of the work provided for by this contract whether brought by employees of the Consultant, by third parties or by Central or State Government authority or any political sub-division thereof.

- 28.1.3 An automobile liability insurance to cover all risks to Owner for each of his vehicles plying on works of this contract.
- 28.1.4 Insurance against fire, theft, damage and loss of all property owned by CONSULTANT at the construction site.
- 28.1.5 Group Personnel Accident insurance covering CONSULTANT'S employees not otherwise already covered under clause 28.1.1 above, operating from the PROJECT site as per CONSULTANT'S established practices.
- 28.1.6 Intentionally Omitted.
- 28.1.7 Owner's Rights: If CONSULTANT fails to fulfill any of its obligations under this Clause, Owner may, but shall not be obligated to, procure insurance meeting the requirements of this Article at CONSULTANT's expense and may deduct the cost thereof from any sums that may be or become due to CONSULTANT under this Contract. The specific amounts and types of insurance, and the other obligations of CONSULTANT relating to insurance shall not in any manner constitute or be construed as a limitation on CONSULTANT's liability under this Contract.

28.2 INDEMNIFICATION

- 28.2.1 CONSULTANT shall indemnify and hold harmless the OWNER, its Affiliates and any co-ventures for any loss (including damage to property not owned by and not under the care, custody or control of OWNER and its Affiliates or any co-ventures and deaths and injuries to the extent such damage, death or injury is caused by the negligent or wrongful acts or omissions of any of CONSULTANT and its Affiliates) arising out of or in connection with the breach of the CONSULTANT's warranties, covenants and obligations under this Contract".
- 28.2.2 "Subject to the provisions of Clause 28.2.3 hereof, OWNER shall indemnify and hold harmless the CONSULTANT and its Affiliates for loss of and damage to property not owned by and not under the care, custody, or control of CONSULTANT and its Affiliates and deaths and injuries to the extent such damage, death or injury is caused by the negligent or wrongful acts or omissions of any of OWNER and, its Affiliates arising out of or in connection with the performance of OWNER'S obligations under this Contract
- 28.2.3 CONSULTANT shall indemnify and hold harmless OWNER including its employees, servants and agents against any loss or liability that may arise on account of death of or injury to CONSULTANT'S personnel and loss or damage to CONSULTANTS property.
- 28.2.4 OWNER shall indemnify and hold harmless CONSULTANT including its employees, servants and agents against any loss or liability that may arise on account of death of or injury to OWNER'S personnel and loss or damage to OWNER'S property provided such loss or damage has not been the result of gross negligence/willful misconduct on the part of the CONSULTANT.
- 28.2.5 Effect of Insurance.
- 28.2.5.1 The obligations of CONSULTANT to indemnify and hold harmless Owner against claims referred to in Clause 28.2.1 and 28.2.2 shall not be limited or reduced by any insurance provided in accordance with Clause 28.0 except to the extent that the proceeds of any such insurance shall be applied to reduce claims made against Owner.
- 28.2.5.2 OWNER shall release and hold CONSULTANT harmless from and against any claim for loss or damage to the Plant (including materials for incorporation therein) or other property of

Special Conditions of Contract - Tender Ref. No. 1000440719

OWNER provided such loss or damage has not been the result of gross negligence/willful misconduct on the part of the CONSULTANT.

28.2.5.3 OWNER shall indemnify and hold CONSULTANT harmless from and against any claim by a third party (other than CONSULTANT'S employees) for loss or damage to property or death or injury to persons which arises out of the Project, except where such loss, damage or injury is due to negligence or default of the CONSULTANT, its affiliates, , personnel or any of them.

28.2.6 Intentionally Omitted.

28.3 INSURANCE AND INDEMNIFICATION BY OWNER

28.3.1 OWNER shall take out and maintain insurance for the PLANT and equipment/materials for incorporation therein against "All Risks" of loss or damage, to the full replacement value thereof, in accordance with good international practice. Such insurance shall be in OWNER'S name and OWNER shall be the loss payee. Cover shall be provided for the equipment/materials in transit to the site. In the event of any loss or damage, CONSULTANT shall assist OWNER in preparing the insurance claim to be submitted by OWNER and shall provide services as necessary to re-procure lost or damaged materials and to require Contractors to repair, replace or reconstruct the damaged part of the PLANT, all such services, Equipment/materials and construction being at OWNER'S cost. OWNER shall, to the extent reasonably possible, procure that it's ensures under such insurance policies waive their rights of subrogation against CONSULTANT.

28.3.2 OWNER shall take out and maintain third party liability insurance, for an ensured amount to cover potential loss or damage to adjacent property and injury to persons arising out of the Project. Such insurance shall be the OWNER'S name and OWNER shall be the loss payee.

28.3.3 Deleted

28.3.4 Deleted.

28.3.5 The CONSULTANT shall ensure that appropriate provisions are inserted into all contracts with Contractors and Vendors, including a "Mutual Hold Harmless" provision whereby each Contractor or other party working on the Site undertakes to bear all liability for loss, damage or injury to its personnel and its property, and to indemnify and hold OWNER, CONSULTANT, their respective Affiliates, co-ventures, officers, directors, employees and all other contractors harmless from any claim that may arise from such loss, damage or injury.

28.4 Other insurance related conditions not specifically mentioned herewith shall be as per GCC.

29 CONFIDENTIAL INFORMATION AND SECRECY

29.1 Confidential information shall mean all technical information relating 'directly or indirectly to the PROJECT which is disclosed to CONSULTANT by LICENSOR, PMC or on behalf of OWNER and by the CONSULTANT.

29.2 CONSULTANT shall not disclose confidential information to any third party without prior written approval of the LICENSOR, PMC and OWNER.

29.3 CONSULTANT shall use the confidential information only for the WORK to be performed for implementing this CONTRACT, and will disclosure of confidential information within its organization to only those of its employees who need to make use of it for the aforesaid purposes.

29.4 The CONSULTANT shall be required to enter into secrecy agreement for non-disclosure of information with OWNER/LICENSOR(s)/PMC.

29.5 CONSULTANT shall ensure that all LICENSOR(s) / PMC confidential information covered by NDA with OWNER and EPCM shall be disclosed to any third party only after ensuring that the third party has entered into an NDA with the LICENSOR(s) & PMC and after obtaining

Special Conditions of Contract - Tender Ref. No. 1000440719

approval from OWNER. CONSULTANT shall take all action as necessary, including insertion of relevant clauses in the tender documents, agreements etc., for third party to obtain consent from the LICENSOR, PMC & BPCL prior to disclosing of LICENSOR / PMC confidential information to third party.

- 29.6 The CONSULTANT, his employees, and agents shall treat as strictly confidential and shall take all steps necessary to ensure confidential handling of all maps, plans, charts, designs, drawings, photographs, data. Reports, tests, specifications, methods and other information developed or acquired by the CONSULTANT from or by means of the tender documents or any facility extended to the CONSULTANT pursuant thereto or the award or performance of the work or any of them or otherwise disclosed or made available to the CONSULTANT or any of the aforesaid persons nor shall report, disclose or reproduce the same in any book, article, disclose or reproduce the same in any book, article, speech or other publications, provided always that the OWNER may upon application by the CONSULTANT to the OWNER in this behalf permit report, disclosure or re-production of the same in any book, article, speech or the publications if it is satisfied that this would not involve the disclosure of any classified or other information which would not be in the interest of public or security to disclose.

Application for such consent shall be submitted to the OWNER in writing outlining the intended use of the relative material and shall be submitted to the OWNER at least one month prior to the expected use accompanied by the text of the relative publication in which it is sought to be used. Photographs should be accompanied by their caption. An application shall not be understood to have been permitted unless expressly permitted in writing by the OWNER/LICENSOR.

30 PATENT INDEMNIFICATION

- 30.1 If CONSULTANT'S work or part thereof or any methods, designs or document furnished or specified by CONSULTANT under this Contract infringes any patent, trademark, design or copyright or would involve the un-authorized use of a third party's trade secrets, CONSULTANT shall, at its sole expense render consultation, assistance and modifications to the Work or part thereof or any methods, designs or things furnished by CONSULTANT under this contract as may be necessary to avoid such infringement or un-authorized use.
- 30.2 If any alleged infringement or un-authorized use as specified in Clause 30.1 is claimed or pursued in courts of law or otherwise by a third party against the Owner, the CONSULTANT agrees to fully defend and indemnify Owner and hold it harmless in respect of any resulting liability. Owner shall give prompt written notice informing CONSULTANT of such claim or suit and CONSULTANT shall, at its sole expense settle such claim or suit in such a way without impairing the work and without affecting the CONSULTANT'S indemnity under this Clause 30.2 and/or at CONSULTANT'S sole cost replace the infringing elements with non-infringing ones.
- 30.3 Owner agrees to provide prompt, written notice to CONSULTANT and to co-operate with and to assist the CONSULTANT in defense of any claim or suit as may be reasonably required by the CONSULTANT. Should Owner seek to settle infringement claims or proceedings it shall first seek CONSULTANT's approval (which shall not be unreasonably withheld) in respect of such settlement. Notwithstanding the foregoing, the CONSULTANT shall in every case secure and guarantee the right of Owner to continue using the work or part thereof without hindrance or interruption and shall reimburse Owner for all costs incurred by Owner in securing such right to the extent CONSULTANT fails to do so.
- 30.4 If any design information furnished by the Owner or by any third party on behalf of the Owner under this contract infringes a patent, design or copyright or would involve the unauthorized use of a third party's trade secrets resulting in any suit or action against CONSULTANT consequent upon the use of such design information by the CONSULTANT in its work, the owner shall fully defend, indemnify and hold harmless the CONSULTANT in respect of any

Special Conditions of Contract - Tender Ref. No. 1000440719

and all liability resulting from such infringement including the costs that may be incurred by CONSULTANT in defending against any suit or cause of action brought against CONSULTANT. This provision shall not be applicable for claims based on NDAs which the CONSULTANT has entered directly with other agencies.

30.5 Other conditions not specifically mentioned herewith shall be as per GCC.

31 TITLE

31.1 Title to work: CONSULTANT agrees that title to the Work or any part thereof shall pass to Owner from CONSULTANT upon commencement of the Work, or any portion thereof, by or on behalf of CONSULTANT.

31.2 Warranty of Title: CONSULTANT warrants good title to the Work.

31.3 Protection of Title: For the purpose of protecting Owner's interest in all Work with respect to which title has passed to Owner but which remains in the possession of another party, CONSULTANT shall take or cause to be taken all steps necessary under the laws of the appropriate jurisdictions to protect Owner's title and to protect Owner against claims by other parties with respect thereto. If, after notice in writing from Owner and the lapse of a reasonable time in which to obtain discharge, CONSULTANT fails to discharge, or, in a manner acceptable to Owner, effectively to provide for such discharge or to secure Owner against any lien or claim upon the Work, arising from CONSULTANT'S performance of the Work, Owner shall have the right, at its option, upon notice in writing to CONSULTANT to provide by agreement, payment or otherwise for the discharge of such lien or claim. CONSULTANT shall reimburse Owner for all amounts expended by Owner to obtain such discharge, including all costs and attorneys' fees and expenses. CONSULTANT shall cause the Work to be suitably marked with an identifying mark or symbol indicating that the Work is the property of Owner.

31.4 Ownership of Designs & Drawings: All designs, drawings, specifications, data, computer printouts, programs and files, documents, reports, studies, manuals, programs, analyses and all other items including copies and originals thereof, produced by CONSULTANT in the performance of the Work (herein collectively referred to as the “**Work Product**”), shall become and remain the property of Owner, and CONSULTANT shall deliver the same (properly sorted and indexed), to Owner in accordance with the provisions of this Contract and in any event upon issue of certificate of approval or earlier termination of this Contract. The provisions of this Clause 31.4 shall survive any termination of this Contract.

32 PROPRIETARY INFORMATION, COMPUTER DATA, LICENSES AND INVENTIONS

32.1 Proprietary Information of Owner

32.1.1 Any information concerning Owner, its operations, data, documentation services or manufacturing processes which are designated as proprietary information by Owner and disclosed to the CONSULTANT in the course of performance of this Contract shall remain the property of Owner and are disclosed in confidence, and no rights are granted to CONSULTANT to reproduce or have re-produced any such information or reveal, disclose, or publish any such information.

32.1.2 CONSULTANT'S Procedures: CONSULTANT represents that it has a policy and procedure designed to protect trade secret rights and its own proprietary information including notices to its employees to prevent unauthorized copying, publication and disclosure of such information. CONSULTANT agrees that proprietary information shall be subject to such policy and procedure, in addition, CONSULTANT agrees that it shall not disclose any proprietary information, nor use proprietary information other than on Owner's behalf, except as Owner may otherwise authorize in writing. If disclosure to a third party is so authorized,

Special Conditions of Contract - Tender Ref. No. 1000440719

CONSULTANT shall first enter into a written confidentiality agreement with said party containing the same terms and conditions with respect to use or disclosure of proprietary information as this Clause 32.1 contains.

32.1.3 Documents: CONSULTANT also agrees to safeguard any documents and information which Owner may supply to CONSULTANT hereunder. CONSULTANT may make copies of such documents only to the extent necessary for the performance of the Work. On completion of the Work, CONSULTANT agrees to return to Owner all documents supplied by Owner and to destroy all copies thereof. Should CONSULTANT, however, desire to retain certain documents and receives Owner's written approval there for, CONSULTANT shall treat said documents as it does proprietary information.

32.1.4 Confidentiality Agreements with Third Parties/BPCL for handling of confidential information of technology, BDEP and FEED from Licensors / PMC: CONSULTANT also agrees to enter into written confidentiality agreements with third parties/BPCL for handling of confidential information of technology BDEP and FEED and BDEP from Licensors / PMC upon Owner's request and to keep in force confidentiality agreements concerning third parties'/Licensors technology, BDEP and FEED and proprietary information, which agreements shall permit CONSULTANT to use such parties proprietary information in the Work.

Except as otherwise prescribed in any confidentiality agreement with third parties/BPCL for handling of confidential information of technology, BDEP and FEED from Licensors / PMC, the obligations in Clause 32.1 shall survive termination of this Contract. As this is proprietary technology and it is important for BPCL's competitiveness, all information on this project shall be held confidentially by CONSULTANT.

The above stated confidentiality requirements shall not apply to:

Information which is *or* becomes, through no fault of CONSULTANT, or its employees, representatives, part of the public knowledge;

or

Information which is or becomes available to CONSULTANT without obligation of confidence and also without restriction on use from sources having the legal right to disclose such information without restriction on use and disclosure, such sources being other than Owner, its Licensors or other Contractors, or a member or members of the Project;

or

Information, which is already in CONSULTANT'S possession without restriction on use and also without restriction on disclosure and was not received in anticipation of the Work.

Information shall not be considered within any of the above exceptions merely because it is embraced by more general information within one of said exceptions. A combination of features of technical information shall not be considered to be within any of the above exceptions unless the combination itself and its principle of operation are within said exceptions.

32.2 CONSULTANT'S Confidential Information: It is not Owner's desire to be afforded access to CONSULTANT'S confidential information. It is therefore agreed that any information which CONSULTANT supply to Owner shall not be subject to any obligation of confidence, (notices on drawings, proposals, graphs, tables, specifications and the like to the contrary notwithstanding), and Owner shall not be liable for any use or disclosure of any of such information unless such information is the subject of an express written confidentiality agreement between Owner and CONSULTANT. CONSULTANT also agrees that it will not disclose to Owner any information which is subject to an obligation of confidence by CONSULTANT to any third persons.

32.3 Computer Data: CONSULTANT undertakes to assure to Owner access to the computer programs and computer data used by CONSULTANT in the performance of the Work for use

Special Conditions of Contract - Tender Ref. No. 1000440719

by or on behalf of Owner for two years from the acceptance of the Work as a whole, and shall deliver all computer programs underlying the development of such data (except those in which CONSULTANT hold a proprietary interest), together with such supplemental information and computer programs as will enable Owner's own computer personnel to understand, use and modify such programs subject to protection of the rights of third parties in said programs.

32.4 **Licenses:** On or before the date of the Certificate of Acceptance of the Work, CONSULTANT shall deliver or cause to be delivered to Owner such licenses of all patents and other proprietary rights held by CONSULTANT, or any of their respective Affiliates as may be required for Owner in the optimal use of the Work in the manner intended. Such licenses shall be in such form as shall be approved by Owner, shall be perpetual, irrevocable, non-exclusive and royalty free to Owner, and shall permit the right to grant sub-licenses to any operator of the said Project or any part or unit thereof for the purposes of operation thereof.

32.5 **INVENTIONS:** CONSULTANT agrees to disclose or cause to be disclosed promptly to Owner all inventions or other developments of proprietary information which CONSULTANT, or any Affiliate of CONSULTANT, or any officer, director, employee, servant or agent of CONSULTANT or any Affiliate thereof, may make as a result of the performance of the Work or which are wholly or in part based upon or derived from information proprietary to Owner. All right, title, copyright and interest in and to such inventions or other developments shall belong to Owner or its designee. CONSULTANT agrees to execute or cause to be executed all documents and perform or cause to be performed other lawful acts which Owner may deem desirable or necessary to perfect its or its designee's title thereto and to obtain and maintain or cause to be obtained and maintained patent coverage and/ or other available intellectual property protection thereon.

33 FORCE MAJEURE: - as per GCC

34 DISPUTE RESOLUTION

34.1 **GENERAL**

Any dispute or difference of any kind whatsoever between Owner and Consultant arising under, out of or in connection with this Agreement shall be settled in accordance with the provisions of this ARTICLE.

34.2 **NOTICE**

Each party shall notify the other in writing when it considers a dispute or difference has /arisen and which it wishes to refer to the other Party for amicable settlement pursuant to Clause 34.3, and to arbitration pursuant to Clause 34.4 in the event that amicable settlement is not reached. Such notice shall contain sufficient information as to the dispute or difference to enable the other Party to be fully informed as to the nature of the dispute, the amount of any monetary claim and the length of any extension of time claimed.

34.3 **AMICABLE SETTLEMENT**

Where notice of dispute or difference has been given under Clause 34.2, the Parties shall attempt to settle such dispute amicably before commencement of arbitration provided that, unless the Parties agree otherwise, such dispute may be referred to arbitration, subject to and in accordance with Clause 34.4 on or after the 60th (sixtieth) day after the day on which notice of dispute or difference was given, attempt for amicable settlement has been made.

34.4 **ARBITRATION – As per GCC**

34.5 **INTEREST PROHIBITION**

Neither party shall be entitled to and claim for any pre-reference or pendente-lite interest, i.e. from the date of cause of action till date of Award by Arbitral Tribunal and claim for any such

interest shall not be entertained by Arbitral Tribunal and be void. Further, Arbitral Tribunal shall have no power or authority to award pre-reference or pendent-lite interest in the matter.

35 JURISDICTION

Notwithstanding any other court(s) having jurisdiction to decide the question, and without prejudice to the provisions or generality of Clause 34, jurisdiction to decide the question(s) arising out of or in relation to this Contract in all matters touching or affecting any arbitration, or arising out of or in relation to or under or in accordance with the Arbitration & Conciliation Act, 1996, or otherwise under or with reference to this Contract shall vest exclusively in the court(s) of competent civil jurisdiction at Mumbai, Maharashtra, India (where this Contract shall be signed on behalf of the Owner) and only the said court(s) shall have jurisdiction to entertain and try any such actions and/ or proceedings to the exclusion of all other courts.

This Agreement (Contract), including all matters connected with this Agreement (Contract) shall be governed by the Indian law exclusively both substantive and procedural, for the time being in force and shall be subject to the exclusive jurisdiction of Indian courts at Mumbai, Maharashtra, India.

36 SUSPENSION, TERMINATION AND CANCELLATION: - as per GCC

37 DROP DEAD FEES

The bidders to note that BPCL may not proceed with further Project execution in any stage of Project activities, depending of project viability and circumstances. If the PRFCCU Project is abandoned by BPCL after pursuing only a part of total consultancy work for reasons not attributable to the CONSULTANT, the drop dead fees will be payable as below:

- 100% payment for components of Work performed up to the month.
- 100% payment in respect of reimbursable expenses incurred up to the month and for which the CONSULTANT is entitled to claim reimbursement in terms of this Contract

For lumpsum fee, separate payment milestones for individual Project progress milestones has been provided - to address the unforeseen case of premature project closure. Payment due to CONSULTANT will be as per above drop dead fee and individual Milestone payment for lumpsum fee, as applicable, depending on the particular project phase in which project is closed or stopped by the Owner (due to reasons not attributable to the CONSULTANT).

38 MISCELLANEOUS

38.1 Independent Contractor: CONSULTANT is an independent contractor under this Contract, and shall have complete charge of all personnel performing any Work under this Contract. CONSULTANT shall perform all Work in accordance with its own methods and shall be fully responsible for the Work performed by it or on its behalf hereunder in accordance with the terms of this Contract. CONSULTANT shall not be deemed an agent of Owner for any purpose pursuant to this Contract.

38.2 Assignments :

38.2.1 The Contract shall not be assigned by either party without the prior written consent of the other party, except that it may be assigned without such consent to a person, firm or company acquiring all or substantially all the business and assets of such party. Provided that no assignment of this contract shall be valid until and unless the obligations of the assignor shall have been assumed by the assignee.

38.2.2 All assignments shall be in terms so as not to prejudice the confidentiality obligations of the parties.

38.3 Entire Contract: This Contract embodies the entire Agreement between the parties hereto, and

Special Conditions of Contract - Tender Ref. No. 1000440719

the parties declare that in entering this Contract they do not rely upon any previous representation, whether express or implied and whether written or oral, or any inducement, understanding or agreement of any kind not included within this Contract and all prior negotiations, representation, contract and/ or agreements and understandings are hereby cancelled.

- 38.4 Resolution of Inconsistencies: All the contract documents shall be read together and as a whole to determine their tone, meaning and intent. In the event of any irreconcilable inconsistency between any of the Articles or Clauses of this Contract, and any Exhibit to this Contract, the Articles or Clauses of this Contract shall prevail. Subject thereto, the provisions of this Contract shall be mutually explanatory. If any inconsistency in this Contract shall become apparent, it shall be resolved by Owner in writing in consultation with CONSULTANT and in accordance with the foregoing order of priority. CONSULTANT shall immediately notify Owner of any inconsistency, which CONSULTANT discovers. If CONSULTANT continues to perform Work after discovering any inconsistency without notifying Owner, CONSULTANT shall be responsible for any consequences, including any necessary rectification or revision of the Work.
- 38.5 Waiver: Failure of either Party to give notice to the other Party of an alleged, breach hereof or default hereunder shall not constitute a waiver of its right to assert its remedies as to such breach or default.
- 38.6 Language: All communications and correspondence in the performance of this Contract shall be in the English language.
- 38.7 Metric System: Except as otherwise may be provided in this Contract, all weights and measures to be made hereunder, shall be expressed in the metric system, including, without limitation, drawings, plans, specifications, designs, surveys, estimates, reports and all other documents and Work originated by CONSULTANT.
- 38.8 Notices: Subject to any provisions in this Contract to the contrary, any notice, or communication sought to be served by the CONSULTANT to the Owner with reference to the CONSULTANT Contract shall be deemed to have been sufficiently served upon the Owner (notwithstanding any enabling provisions under any law to the contrary) only if delivered by facsimile/E mail transmission followed by courier mail delivery, or by registered acknowledgement due post to the office address set forth below:

Address: **CHIEF GENERAL MANAGER, HEAD PRFCCU (PROJECTS)**
Bharat Petroleum Corporation Ltd
Mumbai Refinery
Mahul, Chembur
Maharashtra – 400074

Without prejudice to any other mode of service provided for in this Contract or otherwise available to the Owner, any notice, order or other communication sought to be served by the Owner to the CONSULTANT with reference to this Contract, shall be deemed to have been sufficiently served if delivered by facsimile transmission followed by courier mail delivery, or by registered acknowledgement due post to the principal office of the CONSULTANT.

- 38.9 Severability: In the event that any of the provisions of this Contract are construed as being null and void by a court or otherwise, the remaining provisions shall be regarded as still being in full force and effect.
- 38.10 Counterparts: This Contract may be executed in one or more counterparts, each of which when so executed shall be deemed and original, and such counterparts together shall constitute one and the same instrument.
- 38.11 Effectiveness of Agreement: The effective date of Contract shall be, the date of issue of Letter of acceptance (LOA) LOA or PO whichever is earlier instructing consultant to proceed with the

Special Conditions of Contract - Tender Ref. No. 1000440719

EPCM activities for the project by the Owner (“**Effective Date**”). Until this effective date in accordance with this Clause **38.11**, Owner shall incur no financial obligation of any nature if whatsoever to CONSULTANT under this Contract.

- 38.12 Publicity: No publicity releases (including news releases and advertising) relating to this Contract and the Work shall be issued by CONSULTANT without the prior written approval of Owner. Any inquiry which CONSULTANT may receive from news media concerning this Contract will be referred to the Owner for coordination prior to response.
- 38.13 Any paper, article, publication, or announcement of advances generated in connection with the Services during the period of performance of the Contract or in the future, shall require Owner's prior written approval.
- 38.14 Survival of Contract Provisions: The following provisions of this Contract shall survive any termination of this Contract:
- Taxes and Duties.
 - Warranties and Guarantees
 - Price Reduction
 - Title
 - Proprietary information; Computer Data; Licenses & Inventions.
 - Insurance
 - Indemnification.
 - Patent Indemnification.
 - Arbitration Governing Law.
 - Publicity
- 38.15 Set off: Notwithstanding any other provision hereof relating to rights of set off or deduction, Owner may, but shall not be under any obligation, at any time to set off any and all sums due from Owner to CONSULTANT against sums claimed by Owner from CONSULTANT hereunder. CONSULTANT may not at any time set off sums payable by it to Owner under this Contract.

39 CLAIMS BY CONSULTANT:

- 39.1 Should the CONSULTANT consider that it is entitled to any extra payment or compensation in respect of the Work over and above the amounts due in terms of the Contract or should CONSULTANT dispute the validity of any deductions made or threatened by the Owner from any payments due to it in terms of the Contract, CONSULTANT shall forthwith give notice in writing of his claim in this behalf to the Owner's representative and to the Owner within 15 (fifteen) days from the date of the issue of orders or instructions relative to which the CONSULTANT claims such additional payment or compensation, or of the happening of, any other event upon which the CONSULTANT bases such claim, and such notice shall give full particulars of the nature of such claim, grounds on which it is based, and the amount claimed. CONSULTANT'S right to raise a claim and the Owner's possible liability in respect of any claim raised by CONSULTANT shall arise if and only if CONSULTANT shall have given notice of such claim to the Owner and the Owner's representative in the manner and within the time and giving the particulars aforesaid, and CONSULTANT shall be deemed to have waived any or all claims and all his rights in respect of any claim not notified to the Owner and the Owner's representative in writing in the manner and within the time and giving the particulars aforesaid.
- 39.2 The Owner and/ or Owner's representative shall be under no obligation to reply to any notice of claim given or claim made by CONSULTANT within the provisions aforesaid or otherwise, or to otherwise reject the same, and no such omission or failure shall be deemed to be an admission

Special Conditions of Contract - Tender Ref. No. 1000440719

by the Owner of the validity of such claim or waiver by the Owner of any of its rights in respect thereof.

- 39.3 Any and all notified claims not specifically reflected and included in the final bill shall be deemed to have been waived by CONSULTANT with the intent that CONSULTANT shall have no right to raise or include in the final bill any claim(s) other than a notified claim conforming in all respects to the provisions of the said section
- 39.4 Notwithstanding the existence of any claim by CONSULTANT in terms hereof or otherwise, CONSULTANT shall continue and be bound to continue and perform the Work to completion in all respects according to the Contract unless the Contract be priority determined in terms hereof.
- 39.5 Unless incorporated in a Change Order, signed by the parties, the payment of any sum on account to CONSULTANT during the performance of the Work in respect of which a claim has been notified or the making or negotiation of any interim arrangements in respect of the performance of such work or item or work by the Owner, shall not be deemed to be an acceptance of the related claim by the Owner, or any part or portion thereof with the intent that any such payment shall constitute merely a facility or assistance to the CONSULTANT, and not an obligation upon the Owner.

40 SOLE CONTRACT:

- 40.1 CONSULTANT has to enter into this CONTRACT with OWNER stating all conditions mutually agreed. This CONTRACT is to be executed in duplicate, each of which will be deemed as original, it shall constitute the sole CONTRACT on the subject matter hereof between the parties hereto and supersedes all prior proposals, agreements, promises, representations and communications between the parties hereto.
- 40.2 All annexures to the Contract document shall be deemed to form and be read and construed as part of the CONTRACT.
- 40.3 No oral representations of any officers, agent or employee of either of the parties hereto, shall affect or modify the rights or obligations hereunder. Any promises or representations made by representatives of either of the parties hereto shall be binding only if in writing and signed by an authorized representative of OWNER and or CONSULTANT as the case may be.

41 EXCLUSION OF THE GOVT. OF INDIA'S LIABILITY

- 41.1 It is expressly understood and agreed that the Owner will enter into this Contract solely on its own behalf and not on behalf of any other person or entity. In particular it is expressly understood and agreed that the Government of India are not party to any such Agreement and will have no liabilities, obligation or right whatsoever hereunder. It is expressly understood and agreed that the Owner is an independent legal entity with power and authority to enter into Contracts solely on its own behalf under the applicable laws of India. CONSULTANT expressly agrees, acknowledges and undertakes that the Owner is not an agent, representative or delegate of the Government of India and that of the Government of India are not and shall not be liable for any act, omission, commission breach or other wrong arising out of this Contract.
- 41.2 CONSULTANT hereby expressly waives, releases and forgoes any and any actions or claims, including cross claims, impleader claims or counter claims, against the Government of India arising out of any resultant agreement and covenants not to sue the Government of India for any manner of claim, cause of action or thing whatsoever arising out of or under any such Contract.

42 CESSATION OF RESPONSIBILITIES

Upon CONSULTANT'S Guarantees & Liabilities referred to in Clause 19 of Special Condition of Contract of this Tender document having been or being deemed to have been satisfied or upon expiry of Defect Liability Period (as defined in clause 19.7.1), whichever occurs earlier,

Special Conditions of Contract - Tender Ref. No. 1000440719

all responsibility of CONSULTANT under this CONTRACT shall be deemed to have been discharged. If the performance tests are not undertaken within 18 months of commissioning or 24 months from Mechanical completion for reasons attributable to the Owner, the consultant obligations with respect to performance tests shall be deemed to have been performed. However all the provisions as per 38.14 except warranties and Guarantees will survive.

43 PARTICIPATION IN CONTRACTS FOR PROJECT EXECUTION:

The CONSULTANT or any of its affiliates/associates will be disqualified from subsequently providing goods or work or services or as an Engineering Procurement Construction (EPC) contractor / lumpsum turnkey (LSTK) contractor / PACKAGE Contractor related to the same project.

44 PERMITS & APPROVALS REQUIRED FOR FOREIGN EXPATRIATES:

CONSULTANT shall obtain on their own and at their cost the necessary permits and approvals for foreign expatriates to work in India, if deemed necessary.

45 INTERACTION WITH OTHER AGENCIES:

The CONSULTANTS shall in the course of the work may be required to interact with State/Central Government Departments/Agencies like Ministry of Petroleum & Natural Gas, Government of India; Ministry of Environment & Forests, Central Pollution Control Board, Maharashtra State Pollution Control Board, Ministry of Surface Transport, Local Bodies, Railways, National High-ways Authority; Telecom Departments, Port Authorities, Factories & Boilers, Chief Controller of Explosives, Director General Civil Aviation, District Authorities, Legal Meteorology dept, Central Electric Authority (CEA) of India etc. for obtaining various clearances for the project. The CONSULTANT has also to interact/visit with all the process Licensors and other Consultants/ suppliers/ package contractor / vendors for the project. All expenses in connection with such interactions/visit with agencies stated above in India including travel, accommodation etc. shall be included in quoted lump sum fee. For visit to licensors/ Consultants/ package contractor /vendors/suppliers etc. outside India, the Owner shall reimburse the per-diem rates, all travel and living expenses as per **Appendix-1** to Special Conditions of Contract. Consultant to quote their per diem charges in the prescribed proforma. Consultant to obtain OWNER's approval, prior to undertaking any foreign travel, in connection with Project.

46 STATUTORY APPROVALS:

CONSULTANT shall assist the OWNER for obtaining approval from statutory authorities as required for the implementation of the PROJECT by way of preparing technical documents/drawings, making representations, presentations, participating in the meeting with statutory authorities and furnishing necessary clarifications therein. However, the statutory approvals as required for the implementation of the package units shall be in the scope of respective package Contractors. Consultant has to review and approve the technical documents/drawings prepared by package contractor and provide all necessary assistance for obtaining the statutory approvals. Owner shall act as 'principal employer' for all approvals from various statutory bodies required for the Project and also deal directly with local administration, labour laws, labour disputes, strikes, lock outs, audit queries, queries from any autonomous or governmental bodies, etc.

47 CONSULTANTS ORGANIZATION STRUCTURE FOR THE PROJECT

Consultant to ensure that adequate skilled experienced and quality manpower are to maintained both in head office and at Site during the course of Project. Detailed write up on the manpower required is given in Chapter-4 of 'Technical Section- Scope of Work' of this tender document. Consultant to furnish the exact manpower proposed to be positioned both at Head Office and Site for the Project and this shall be discussed and finalized with Owner. Consultant should

Special Conditions of Contract - Tender Ref. No. 1000440719

submit the credentials of site manpower and obtain acceptance by BPCL. This shall be part of the Contract document.

Permanent video conferencing facility to be made available & put in service at Consultant's head office to enable regular interaction and discussions with BPCL engineering and site team at Mumbai refinery and also with CONSULTANT site.

48 POSTING OF CONSULTANT'S PERSONNEL TO LICENSOR'S/PACKAGE CONTRACTOR'S OFFICE.

During the performance of the job, the Consultant may have to undertake travel (s) to the office(s), of the suppliers of basic engineering design packages, suppliers and package contractors. All costs associated with such travel(s), stay, etc. in India shall be included in quoted lump sum. For travel outside India, Owner shall reimburse the expense as per **Appendix-1** to Special Conditions of Contract.

49 OFFICE ACCOMODATION FOR OWNER'S STAFF IN THE ENGINEERING OFFICE OF THE CONSULTANT IN INDIA:

In order to have close interaction in the day-to-activities, the Consultant shall provide furnished office accommodation with all facilities for document reproduction, communication, fax etc. in the consultant's design/Engineering/Procurement office. The facilities shall include furnished office space for 2 officers of Owner along with fax, telephone Internet, and e-mail facility. The cost for such office accommodation shall be included in the quoted lump sum price.

50 VALIDITY OF THE OFFER

The offer shall be valid for a period of 6 (six) months from the date of opening of bid. The bidder shall not be entitled during the said period of six months, without the consent in writing of the Owner, to revoke, or cancel his bid or vary the bid given or any terms thereof. In case of bidder revoking or cancelling his bid or varying any terms in regard thereof without the consent of Owner in writing, EMD submitted by the bidder shall be forfeited.

51 [Deleted]

52 DEVELOPMENT OF MSE

BPCL is committed to promotion and development of micro and small enterprises. Accordingly, bidders are also encouraged to promote the same by considering MSE sub-suppliers/ sub-contractors to the extent possible under the Orders/ Contracts awarded on them. All efforts shall be made by bidder to encourage procurement through MSEs (holding valid certificate) through their sub orders/ sub contract procurement. The successful bidder shall provide the following only for the purpose of reporting.

- i) Reports for purchase of material/services/ sub-contracts (from MSE vendors) shall be submitted by bidder to BPCL after placement of contract.
- ii) The report shall be signed by authorised person of contractor
- iii) Report shall be submitted in the following format.

Sl. No.	Sub-Supplier/ Subcontract or	Work order no. & date	Item Description	Amount (In Rs)	Category of MSE Gen/ SC/ ST/ Women	MSME Status Micro/ Small with code	Remarks

Special Conditions of Contract - Tender Ref. No. 1000440719

53 COMPLIANCE OF GOVERNMENT SOCIAL SECURITY SCHEMES

- 53.1 Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) and Pradhan Mantri Suraksha Bima Yojana (PMSBY).

Government of India has recently introduced Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) and Pradhan Mantri Suraksha Bima Yojana (PMSBY) to provide life and disability coverage to the unorganised workers (in the age group 18-50 years) depending upon their eligibility. PMJJBY gives coverage of Rs.2 lakhs on death at premium of Rs.330/- per annum. PMSBY gives coverage of up to Rs.2 lakhs on accidental death and disability at premium of Rs.20 per annum.

We request you to ensure that all your employees are enrolled in the said schemes to derive the maximum benefit of the scheme to your employees.

Bidder is requested to fill the below format and provide along with the unpriced bid/ after order

Sl No	No. of Manpower (engaged directly or through contracting)		No of Manpower under Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)		No. of contract Manpower under Pradhan Mantri Suraksha Bima Yojana (PMSBY)	
	No Direct employees	No of contract employees engaged	No Direct employees	No of contract employees engaged	No Direct employees	No of contract employees engaged

TENDER FOR

EPCM SERVICES FOR PETRO RESID FLUIDIZED

CATALYTIC CRACKING (PRFCC) UNIT AND ITS ASSOCIATED

FACILITIES AT MUMBAI REFINERY

TENDER REF. NO. : 1000440719

PRICE SCHEDULE

PRICE
SCHEDULE
(APPENDIX-1)

**PRICE SCHEDULE FOR THE TENDER OF “EPCM SERVICES FOR PETRO
RESID FLUIDISED CATALYTIC CRACKING (PRFCC) UNIT AND ITS
ASSOCIATED FACILITITES AT MUMBAI REFINERY”**

CONTENTS:

Sl. No.	Description
1	PREAMBLE AND GENERAL INSTRUCTIONS FOR PRICE SCHEDULES
2	PREAMBLE FOR LUMP SUM PRICE SCHEDULE & LUMP SUM PRICE SCHEDULE, FORM-1
3	PREAMBLE FOR MAN-MONTH RATES & PRICE SCHEDULE FOR MAN-MONTH RATES, FORM-2
4	PREAMBLE FOR PER-DIEM / MANDAY RATE & PRICE SCHEDULE FOR PER-DIEM / MANDAY CHARGES, FORM-3
5	EVALUATION CRITERIA OF THE BIDS
6	PRICE VARIATION CLAUSE

1. PREAMBLE AND GENERAL INSTRUCTIONS FOR PRICE SCHEDULES

- 1.1. The BIDDER is deemed to have studied the specifications and details of work to be done within the time schedule and shall have acquainted himself of the conditions prevailing at site and the prices are offered in line with the same.
- 1.2. The price schedule shall be read with all other sections of “bidding document”, such as the conditions of contract and the specifications as these documents are jointly explanatory and descriptive of the work included in the contract. Any interpretation of the scope of work, made in the schedule of rate (SOR) or technical specification in isolation shall not be valid for any extra claims.
- 1.3. The quoted rates shall be inclusive of all taxes except Goods and Services Tax (GST).
- 1.4. Any change in the format may result in summarily rejection of the offer without any reference whatsoever to the bidder.
- 1.5. All other columns in price formats except price (rate & amount) columns to be filled up and submitted along with part-I: Techno-commercial part of the bid.
- 1.6. Bidders are requested to quote prices (rate) in the price bid form only.
- 1.7. The price schedule comprises of 3 parts (FORMS) as indicated below, Viz;

a) Lump sum price schedule, Form-1:

The Total Lumpsum charges for consultancy services (Form 1) against **Engineering Procurement and Construction Management (EPCM) Services for Petro Resid Fluidized Catalytic Cracking (PRFCC) Unit and its Associated facilities at Mumbai Refinery** of the project as per scope.

b) Price schedule for Man- Month rates, Form-2:

Bidders shall separately indicate in their bids in Form-2 the rates for Man-Month Charges payable on prior written approval from OWNER.

These rates shall be operated in the event of the actual Project completion period extending beyond the contractual completion period, for reasons which are not attributable to the Consultant and Package contractors / site contractors/vendors/suppliers. In this case BPCL will reimburse the consultant for site jobs for construction management, assistance for pre-commissioning / commissioning / startup / PGTR etc., for the period beyond the contractual completion date.

No Man-month rate shall be considered for reimbursement if the project is delayed

solely due to reasons attributable to consultant.

No Man-month rate shall be considered for reimbursement for the contract closure / Warehouse closure / Project closure period post commissioning and startup.

In the event that the Consultant fails to deploy the minimum manpower as stipulated in the Manpower Deployment Chart provided in Chapter 4 of the “Technical Section – Scope of Work,” resulting in actual project completion extending beyond the contractual completion date / period, the shortfall in deployed man month for each personnel category shall be deducted in the ‘man-month reimbursement entitled for consultant beyond contractual completion period’.

In the event actual Project completion extends beyond the contractual completion date / period for reasons **which are attributable to supplier/contractors/ Package contractors concurrent with or without delay from consultant/owner**, payment of additional man-months will be made at reduced rates as indicated in the table below (since the consultant is responsible for Construction Management of EPCM Supply & service contracts and Package Contracts).

For exceeding actual project completion up to 12 months (inclusive of 12th month) from contractual completion date	@95% of quoted rate in Form-2
For exceeding actual project completion beyond 12 months (13th month onwards) from contractual completion date	@85% of quoted rate in Form-2

In the following scenario:

- No man-month rate shall be considered for reimbursement within the Contractual Completion Date/Period, even if the deployed manpower exceeds the minimum requirement specified in the Manpower Deployment Chart provided in Chapter 4 of the “Technical Section – Scope of Work.”
- No deductions or penalties shall be applicable in the event the deployed manpower is less than the minimum specified in the Manpower Deployment Chart provided in Chapter 4 of the “Technical Section – Scope of Work,” provided that the actual completion of the project occurs within the Contractual Completion Date/Period.
- No reimbursement and No deductions or penalties shall be applicable in the event the deployed manpower is less than the minimum specified in the Manpower Deployment Chart provided in Chapter 4 of the “Technical

Section – Scope of Work,” provided that the actual completion of the project occurs within or beyond the Contractual Completion Date/Period. However, any additional manpower deployed beyond minimum manpower chart shall be re-imbursed provided the same is deployed beyond Contractual Completion Date/Period and the delay is not solely attributable to consultant.

Payment shall be initiated after approval of time extension from the competent authority of BPCL.

Also, these quoted rates shall be operated in the event of works carried out by the consultant extra to the tendered scope as per the requirement of BPCL. However, all services/ travel shall be executed as per the requirement of BPCL with prior written consent of BPCL

c) Price Schedule For Per-Diem / Manday Rate, Form - 3

I. Price schedule for Per-diem / Manday rate for visits to Foreign Countries (other than India) exclusive of travel and related expenses

The per-diem rate is exclusive of lodging & boarding, to & fro air fare, and local transport, foreign visa charges, etc. The charges mentioned above shall be paid at actual against documentary evidence.

The per-diem rate shall be applicable for any overseas services as per the requirement of BPCL. However, all overseas services/ travel shall be executed as per the requirement of BPCL with prior written consent of BPCL.

II. Price schedule for Per diem / Manday rate for performing additional services other than tendered scope (if any) all-inclusive with travel and related expenses

The per-diem / Manday rate shall be applicable on works carried out by the consultant / Home office services extra to the tendered scope as per requirement of BPCL. However, all services/ travel shall be executed as per the requirement of BPCL with prior written consent from BPCL.

The per-diem / Manday rate is inclusive of all travel & associated expenses such as to & fro air fare, lodging, out-of-pocket expenses, local transport and other such travel expenses.

- 1.8. All price schedule formats columns to be filled up with “Q” for quoted and “NQ” for Not Quoted and shall be submitted along with Techno-commercial part of the bid. All the pages of the price schedule and preamble along with instructions shall be signed and submitted by Authorized signatory of the bidder. **No prices shall be provided in the**

unpriced/technical bid. Incomplete bids shall be liable for rejection.

- 1.9. Prices shall be filled only in the price bid and shall be uploaded only in the priced part of the tender document. Prices shall be quoted in Figures and words. In case of mismatch between prices in figures and words are noted, the prices indicated in words shall prevail.
- 1.10. The price bid shall be in the schedule of rates provided herewith without any conditions. Any corrections/Lineation in the price bid shall be avoided. In case of any correction/lineation, the same shall be countersigned by the Authorized signatory of the bidder.
- 1.11. Indian bidders shall quote in Indian Rupee and foreign bidder can quote in USD/Euro only. Currency of Foreign Component shall be mentioned in the Priced & Unpriced Bid. In case of any discrepancy, the currency quoted in the Priced Bid shall prevail. In case of foreign bidder quoting in foreign currency, the purchase order (in the event of the same) shall be placed in their foreign address only. The currency once quoted shall not be changed.
- 1.12. The quoted rates shall be up to two decimals only. In the case after opening of price bids it is observed that the quoted rates consist of more than two decimal places, then only figures up to two decimals places shall be considered for evaluation purposes.
- 1.13. Any change in the price schedule formats may result in summarily rejection of the offer without any reference whatsoever to the bidder.
- 1.14. In case it is decided not to proceed any further in the Project execution at any project phase by BPCL, there shall not be any financial liability on either side for the remaining stages/ Part of Consultancy services.
- 1.15. The Offer from Foreign bidders shall be inclusive Indian Income Taxes (withholding tax). In case India has a Double Taxation Avoidance Agreement (DTAA) with the foreign country (country of the bidder), the bidders can claim the benefit under such DTAA by providing the following documents:
 - (1) Permanent Account Number (PAN) or details in lieu of PAN as per Indian Income Tax requirement,
 - (2) Tax Residency Certificate (TRC) from govt. of foreign country
 - (3) Form No.10F electronically generated from Income Tax portal
 - (4) No Permanent Establishment declaration.

In case the Bidder fails to submit these documents, benefit of DTAA shall not be provided.

In case quoted prices of Bidder are net of withholding tax, then the quoted prices shall be

loaded for withholding tax based on the percentages worked out above for evaluation.

1.16. Contract Price Entitlement

Owner shall compensate CONSULTANT, where specified, for full and complete performance of the Work accepted by Owner if:

- i. CONSULTANT has complied with all the terms and conditions in all parts of the Contracts and
- ii. CONSULTANT has fulfilled all of its financial obligations incurred as a result of its performance of the work.

Compensation shall be the sum of the Lumpsum prices, payment against actual manpower deployed as per Per-diem rate and Man-Month Rates all of which are subject to the provision of the Contract and all of its part, which shall constitute the totality of the payments and compensation due to CONSULTANT.

The Lumpsum Price specified in para 1.7 (a) above shall be subject to reduction if there is any reduction in the Consultant's Scope of Work and rebate offered, if any in the Summary of Schedule of Rates based on efforts calculation mutually agreed by both the parties.

1.18 MAN-MONTH (MM) working hours basis:

The Man-month mentioned in form-2 is defined as below.

"Man-Month" means a unit of measurement corresponding to the presence and availability for performing Services of one (1) man for 26 days@8 hours per day (8 hours per day excluding lunch and tea/snacks breaks) or 208 hours in a calendar month excluding lunch & tea/snacks break times.

Consultant personnel may be required to put in additional work hours depending upon work urgency for the job in progress on all days including Sundays/holidays, for which consultant shall be compensated/paid on pro-rata basis for Engineer category only.

If there is any increase and decrease in working days / hours, the same shall be paid on pro-rata basis for the Engineer category only.

For the month of February, the number of man-days shall be considered as 24 days.

1.19 Per Diem / Manday charges working hours basis

Per-Diem / Man-day rate mentioned in form 3 is defined below in two categories:

- a) Per-diem rate for visits to Foreign Countries (other than India) exclusive of travel and related expenses.

The per-diem rate shall be applicable for 8 working hours excluding lunchtime, tea breaks and local travel time and shall be applicable for all working days, holidays and Sundays if spent at work as directed by BPCL. For more than 8 working hours, payment shall be made on pro-rata basis.

The per-diem rate is exclusive of lodging & boarding and to & fro air fare (economy class). The charges mentioned above shall be paid at actual against documentary evidence.

- b) Per diem rate for visits within India for performing additional services other than tendered scope (if any) all-inclusive with travel and related expenses.

The per-diem rate is inclusive of all travel & associated expenses such as to & fro air fare, lodging, out-of-pocket expenses, local transport and other such travel expenses.

The per-diem rate shall be applicable for 8 hours excluding lunch & tea break time. For more than 8- hour, payment shall be made on pro-rata basis.

For visits within India travelling time will not be considered for reimbursement.

CONSULTANT shall note that manpower deployment will be finalized in consultation & due approval from BPCL with respect to qualification, experience, date of deployment & duration of deployment. The CV shall be submitted in advance for approval of BPCL.

CONSULTANT to also note that in order to ensure uninterrupted working for the project, BPCL has the right to request the CONSULTANT to ensure for presence of CONSULTANT personnel on Sundays/public holidays by re-scheduling their work schedule.

- 1.20 Irrespective of mentioned anywhere in the tender bidders to note that due to incorporation of Manday / Man month rate for addition / deletion of scope of work, the defined time schedule shall not be changed.
- 1.21 Bidder to quote strictly as per the format of the financial bid.
- 1.22 Administrative / Ministerial Staff shall be as per the bidder's requirement and included in the quoted rate of technical personnel. Only Technical personnel as mentioned above shall be paid as per actual deployment.
- 1.23 Bidder shall quote the man-month Prices for all categories of manpower as specified in the tender.

(STAMP AND SIGNATURE OF TENDERER)

2.0 PREAMBLE FOR LUMP SUM PRICE SCHEDULE

2.1 The bidder shall provide The Total Lumpsum charges for CONSULTANCY SERVICES

- a) The Total Lumpsum charges for ENGINEERING, PROCUREMENT & CONSTRUCTION MANAGEMENT EPCM services for PRFCCU and its associated facilities Project at MR- Overall project management, Developing project procedures and project management plan, activities as listed in technical scope, Review, Updation, preparation and finalization of Basic Design Engineering Package (BDEP) / Process Package/ Design Basis submitted by Process Licensor(s) / PMCs, Review, Updation, Preparation and Finalization of BDEP/ Front-End Engineering Design (FEED) for all Licensed & Open Art units, Review, Updation, preparation and finalization of Basic Design Engineering Package for OSBL (Offsite & Utilities), Detailed and Residual engineering for PRFCCU / ARU / SWS / PRU(Part), PTU, Caustic Merox and Utilities & Offsite facilities, Tendering & Award of work packages/Conventional items and other work/contract packages, Tendering and award of long lead items (LLI's), other equipment & items, Preparation of tender documents, Tendering and award of contracts, Review of detailed engineering documents by vendors/contractors, IBR package preparation/ Coordination with GBI for obtaining IBR certification, assistance for Statutory Approvals / Clearances, Procurement & Contract Services Assistance, Inspection & Expediting, Quality management, Assistance for Transportation of Over Dimensional Consignments including route survey, Material Control & Warehouse Management, Construction management & supervision including Quality Assurance, Mechanical Completion, assistance in start-up, Pre-commissioning, Commissioning & Performance Guarantee Test Run (PGTR) activities and project closure activities including final bill/invoice for the project at Mumbai refinery of Bharat Petroleum Corporation Limited, India in line with the bidding documents, specifications and conditions.

The deployment of minimum manpower shall be as per Manpower deployment chart as provided vide Chapter-4 of 'Technical Section- Scope of Work' of this tender document.

2.2. The fixed Lumpsum prices and other rates set forth for the entire duration of the project tendered scope herein shall be inclusive of:

- a. All costs, risk and expense, taxes & duties including income and withholding taxes, Rupee components, Cess, any escalation in material prices and wages, overhead, inland travel & related expenses & other levies at prevailing rates, profit and/or total fee related to the satisfactory performance and completion of the Work, excluding

GST as applicable, which shall be paid by the Owner on production of suitable document.

- b. All costs related to management, supervision, design, engineering, subcontracts attendance at all meetings in India with OWNER (whether at OWNER's premises/ vendors / packages/ works Contractor premises; OWNER's nominated location or CONSULTANT's premises and any other location applicable prior to and/or during the project), inspection, testing and quality assurance/ quality control of the Work, as more particularly described in the Scope of Work, or elsewhere in the Contract; (Inspection & Testing in this context implies witnessing, checking, verifying of Inspection & Testing of work performed by Contractors at site);
- c. The cost of all CONSULTANT's personnel, supervision, management, (including but not limited to wages, benefits, payroll, taxes, travel and accommodation expenses, and other costs thereto as are paid to employees), all office equipment, rental of third party office equipment, computers communications equipment, communication charges (including those incurred by OWNER while in CONSULTANT's offices), all administrative costs of CONSULTANT's operation (including home office, site office and any other office), all reproduction and graphic costs of whatever kind, postage and courier expenses;
- d. The cost of all travel and accommodation expenses within India.
- e. The cost of all travel and related expenses undertaken by the CONSULTANT's personnel posted at site/deputed from home office for the performance of CONSULTANT's services towards startup/ commissioning assistance.
- f. The cost of royalties, license fee and other fees, duties, penalties and damages whatsoever payable for or in respect of any patented goods, materials, equipment or processes being employed by CONSULTANT in or relative to the performance of the work and/or for the acquisition or use of any right, license, consent or other privileges required by the CONSULTANT for or relative to the performance of the work;
- g. The cost of all guarantees, indemnities to the OWNER and insurance premium required in terms of the Contract or under any law, rule or regulation or otherwise CONSULTANT deems fit to take out and the cost of all risks whatsoever (foreseen and unforeseen) including, but not limited to the risk to delay or reduction or increase in the Scope of Work and/or cancellation of contract and/or accidents, strikes, civil commotion, labour trouble, third party breach, fire, lightening, inclement weather, storm, tempest, flood, earth quake and other acts of God,

restriction of dislocation of road/rail and other transport for access, suspension of work and sabotage;

- h. All supervision charges, establishment overheads, finance charges and other costs and expenses of CONSULTANT;
- i. All other costs or expenses of any kind which directly or indirectly relate to accomplishing the Work and complying in full with the provisions of the Contract, and which are not otherwise specifically set forth or referred to in the Contract.
- j. The Offer from Foreign bidders shall be inclusive Indian Income Taxes (withholding tax). In case India has a Double Taxation Avoidance Agreement (DTAA) with the foreign country (country of the bidder), the bidders can claim the benefit under such DTAA by providing the following documents:

(1) Permanent Account Number (PAN) or details in lieu of PAN as per Indian Income Tax requirement,

(2) Tax Residency Certificate (TRC) from govt. of foreign country

(3) Form No.10F electronically generated from Income Tax portal

(4) No Permanent Establishment declaration.

In case the Bidder fails to submit these documents, benefit of DTAA shall not be provided. In case quoted prices of Bidder are net of withholding tax, then the quoted prices shall be loaded for withholding tax based on the percentages worked out above for evaluation.

2.3. The price quoted shall be firm without any variation up to another 18 (Eighteen) months from the date of contractual completion of the Project.

2.4. Prior to deployment by consultant of personnel, Consultant shall submit the detailed CVs of such person proposed to be posted at site to Owner for concurrence & approval. The Consultant shall also obtain clearance from the Owner for the various types/ categories/ nos. of personnel required and the approximate duration(s) of their stay. Any concurrence/ approval of the Owner does not relieve Consultant of his responsibilities and all the liabilities to this effect shall be of consultant.

All technical persons proposed to be posted at site should have a minimum of 4 years of experience. No Contract engineers shall be permitted, and all personnel shall be in the rolls of consultant. However, on exigencies, Contract engineers may be permitted (except for RCMs / Dy.RCMs / Area in charge) with prior approval from OWNER and they should have a minimum of 7 years of experience.

2.5. Technical Personnel proposed by Bidder for deployment at site for performance of above

services should be adequately qualified (minimum qualification Graduate in Engineering) & have the experience of min. 4 years in execution of projects in their respective field. Safety Officer/ Engineer shall have a Degree in Engineering / Diploma in Industrial Safety and 4 years of experience in project construction sites. Stores officers shall be graduates and have a minimum experience of 4 years in project construction site. Deputy RCM / Area in Charge should be adequately qualified (minimum qualification -Graduate in Engineering) & have the experience of min. 10 years in execution of projects in their respective field. Engineer-in-Charge (RCM) shall be adequately qualified (minimum qualification -Graduate in Engineering) and have experience of more than 15 years in project execution with total experience more than 25 years and should have handled & successfully completed one Project of similar magnitude in the refinery/ petrochemical sector.

- 2.6. Should the performance of any of Consultant's personnel be found unsatisfactory by Owner, the replacement of such personnel shall be carried out by consultant within 7 days of notification by Owner. Also, owner has the right to ask for excess man-power deployment, over and above the deployment chart for any month, at any point of time, without any extra cost to Owner. Consultant has to engage the required category of personnel, as demanded by owner, within 7 days of notification by owner.
- 2.7. Summary of Milestone payments: After award of work, successful bidder shall also provide the detailed breakdown of the Lumpsum Price for each milestone matching with the ceiling indicated in the table under the clause 12 "TERMS OF PAYMENT" of SCC.
- 2.8. CONSULTANT shall deploy two full time personnel at BPCL Office over and above the numbers indicated as per manpower deployment chart, exclusively for carrying out SAP and procurement related activities. This deployment should be included within the Lumpsum Price.

(STAMP AND SIGNATURE OF
TENDERER)

FORM-1: LUMP SUM PRICE SCHEDULE

Sl. No.	Description	Currency of quote (INR/USD/ EURO)	Amount in Figures	Amount in words
1.	The Total Lumpsum charges for ENGINEERING, PROCUREMENT & CONSTRUCTION MANAGEMENT EPCM services for PRFCCU and its associated facilities Project at MR- Overall project management, Developing project procedures and project management plan, activities as listed in technical scope, Review, Updation, preparation and finalization of Basic Design Engineering Package (BDEP) / Process Package / Design Basis submitted by Process Licensor(s) / PMCs, Review, Updation, Preparation and Finalization of BDEP/ Front-End Engineering Design (FEED) for all Licensed & Open Art units, Review, Updation, preparation and finalization of Basic Design Engineering Package for OSBL (Offsite & Utilities), Detailed and Residual engineering for PRFCCU / ARU / SWS / PRU(Part), PTU, Caustic Merox and Utilities & Offsite facilities, Tendering & Award of work packages/Conventional items and other work/contract packages, Tendering and award of long lead items (LLI's), other equipment & items, Preparation of tender documents, Tendering and award of contracts, Review of detailed engineering documents by vendors/contractors, IBR package preparation/ Coordination with GBI for obtaining IBR certification assistance for Statutory Approvals / Clearances, Procurement & Contract Services Assistance, Inspection & Expediting, Quality management, Assistance for Transportation of Over			

	Dimensional Consignments including route survey, Material Control & Warehouse Management, Construction management & supervision including Quality Assurance, Mechanical Completion, assistance in start-up, Pre-commissioning, Commissioning & Performance Guarantee Test Run (PGTR) activities and project closure activities including final bill/invoice for the project at Mumbai refinery of Bharat Petroleum Corporation Limited, India in line with the bidding documents, specifications and conditions.			

Notes:

1. Indian bidders shall quote in Indian Rupee and foreign bidder can quote in USD/Euro only.
2. Lumpsum Price shall be inclusive of all taxes & duties including income and withholding taxes, Cess, inland travel & related expenses & other levies at prevailing rates, but excluding GST as applicable, which shall be paid by the Owner on production of suitable documents.
3. The amount mentioned in the lumpsum price schedule shall be considered for evaluation.

(STAMP AND SIGNATURE OF
TENDERER)

3.0 PREAMBLE FOR MAN-MONTH RATES

- 3.1 Bidders shall separately indicate in their bids in Form-2 the rates for Man-Month Charges payable on prior written approval from OWNER.
- 3.2 These rates shall be operated in the event of the actual Project completion period extending beyond the contractual completion period, for reasons which are not attributable to the Consultant and Package contractors / site contractors/vendors/suppliers. In this case BPCL will reimburse the consultant for site jobs for construction management, assistance for pre-commissioning / commissioning / start up / PGTR etc., for the period beyond the contractual completion date. The consultant has to quote for the man-month quantity as per the SOP. The number of Man-month can be enhanced by Owner on the basis of assessment of additional requirement of Man-months.
- 3.3 No Man-month rate shall be considered for reimbursement if the project is delayed solely due to reasons attributable to Consultant.
- 3.4 No Man-month rate shall be considered for reimbursement for the contract closure / Warehouse closure / Project closure period post commissioning and startup.
- 3.5 In the event that the Consultant fails to deploy the minimum manpower as stipulated in the Manpower Deployment Chart provided in Chapter 4 of the “Technical Section – Scope of Work,” resulting in actual project completion extending beyond the contractual completion date / period, the shortfall in deployed man month for each personnel category shall be deducted in the ‘man-month reimbursement entitled for consultant beyond contractual completion period’.
- 3.6 In the event actual Project completion extends beyond the contractual completion date / period for reasons **which are attributable to supplier/contractors/ Package contractors concurrent with or without delay from consultant/owner**, payment of additional man-months will be made at reduced rates as indicated in the table below (since the consultant is responsible for Construction Management of EPCM Supply & service contracts and Package Contracts).

For exceeding actual projection completion up to 12 months (inclusive of 12th month) from contractual completion date	@95% of quoted rate in Form-2
For exceeding actual project completion beyond 12 months (13th month onwards) from contractual completion date	@85% of quoted rate in Form-2

3.7 In the following scenario:

- No man-month rate shall be considered for reimbursement within the Contractual Completion Date/Period, even if the deployed manpower exceeds the minimum requirement specified in the Manpower Deployment Chart provided in Chapter 4 of the “Technical Section – Scope of Work.”
- No deductions or penalties shall be applicable in the event the deployed manpower is less than the minimum specified in the Manpower Deployment Chart provided in Chapter 4 of the “Technical Section – Scope of Work,” provided that the actual completion of the project occurs within the Contractual Completion Date/Period.
- No reimbursement and No deductions or penalties shall be applicable in the event the deployed manpower is less than the minimum specified in the Manpower Deployment Chart provided in Chapter 4 of the “Technical Section – Scope of Work,” provided that the actual completion of the project occurs within or beyond the Contractual Completion Date/Period. However, any additional manpower deployed beyond minimum manpower chart shall be re-imbursed provided the same is deployed beyond Contractual Completion Date/Period and the delay is not solely attributable to consultant.

3.8 Payment shall be initiated after approval of time extension from the competent authority of BPCL.

3.9 Also, these rates shall be operated in the event of works carried out by the consultant extra to the tendered scope as per the requirement of BPCL. However, all services/ travel shall be executed as per the requirement of BPCL with prior written consent of BPCL

3.10 For any extension of time as permitted due to **FORCE MAJEURE** conditions as per GCC, No man month rates reimbursement shall be provided for the additional period so granted.

3.11 Payment for deployment of personnel with respect to which Man-Month Rates are payable shall be paid on the rates quoted and for the actual duration of their respective deployments at site and duly certified by Engineer-in-Charge.

3.12 Bidders will quote the Man month Prices for the different categories of personnel which the bidder envisages are likely to be involved in the performance of the activities and to be paid for at Man-Month Rate basis under 3.0 hereof above, in Indian Rupees.

3.13 MAN-MONTH (MM) working hours basis: The CONSULTANT shall be entitled to charge Man-Month Price for only such time which is directly spent by the Personnel in performance of Services.

"Man-Month" means a unit of measurement corresponding to the presence and availability for performing Services of one (1) man for 26 days@8 hours per day (8 hours per day excluding lunch time) or 208 hours in a calendar month excluding lunch time. If there is any increase and decrease in working days / hours, the same shall be paid on pro-rata basis for the Engineer category only.

The senior category manpower, viz. Project Manager / Resident Construction Manager/ Deputy Resident Construction Manager/ Lead Engineer/ Area I/C, etc. man-month shall also mean the presence and availability for performing Services of one (1) man for 26 days @ 8 hours per day (8 hours per day excluding lunch time) or 208 hours in a calendar month excluding lunch time. If there is any decrease in working days/hours shall be paid on pro-rata basis. However, they are supposed to extend their services for ensuring execution of works beyond standard working hours without any additional cost to BPCL and increase beyond standard working hours during the month will not be paid for this category of manpower. Bidder shall quote the prices for senior category of manpower considering the same.

For the month of February, the number of man-days shall be 24 days @ 8 hours per day (excluding lunch time) or 192 hours.

- 3.14 Prior to deployment by consultant of personnel with respect to any services covering construction management, supervision, startup and/ or commissioning assistance at site for and in the construction of the Project in relation to any services specified in hereof above, Consultant shall submit the detailed CVs of such person proposed to be posted at site to Owner for concurrence & approval. The Consultant shall also obtain clearance from the Owner for the various types/ categories/ nos. of personnel required and the approximate duration(s) of their stay. Any concurrence/ approval of Owner does not relieve Consultant of his responsibilities and all the liabilities to this effect shall be of consultant.
- 3.15 Should the performance of any of Consultant's personnel be found unsatisfactory by Owner, the replacement of such personnel shall be carried out by consultant within 7 days of notification by Owner. Also, owner has the right to ask for excess man-power deployment, over and above the deployment chart for any month, at any point of time, without any extra cost to Owner. Consultant has to engage the required category of personnel, as demanded by owner, within 7 days of notification by owner.
- 3.16 The Owner and Consultant shall jointly maintain a record of all Consultant's personnel chargeable at Man-Month Rates deployed each day which shall be used as the basis for calculating payments due to the Consultant for the services.
- 3.17 While working out the Site Organization for Construction Management & Supervision and

Assistance in Start up, Commissioning & Performance Test Runs, Consultant shall take the utmost care and shall deploy different categories of personnel which the Consultant feels are necessary for such required period for the performance of all the relevant Services required.

- 3.18 Also, owner has the right to ask for additional man-power deployment, over and above the quantity mentioned in FORM-2 below. Consultant has to engage the required category of personnel, as demanded by owner, within 1 week of notification by owner. The reimbursement of man month in such cases will be based on the reasons of delay which is mentioned in this Preamble.
- 3.19 Technical Personnel (Engineer) proposed by Bidder for deployment at site for performance of above services should be adequately qualified (minimum qualification -Graduate in Engineering) & have the experience of min. 4 years in execution of projects in their respective field. Safety Officer/ Engineer shall have a Degree in Engineering / Diploma in Industrial Safety and 4 years of experience in project construction site. Stores officers shall graduate and have minimum experience of 4 years in project construction sites. Deputy RCM / Area in charge should be adequately qualified (minimum qualification -Graduate in Engineering) & have the experience of minimum 10 years in execution of projects in their respective field. RCM shall be adequately qualified (minimum qualification Graduate in Engineering) and have experience of more than 15 years in project execution with total experience more than 25 years and should have handled & successfully completed one Project of similar magnitude in the refinery/ petrochemical sector.
- 3.20 All technical personnel (Engineers) proposed to be posted at site should have a minimum of 4 years of experience. No Contract engineers shall be permitted, and all personnel shall be on the payrolls of consultant. However, in exigencies, Contract engineers may be permitted (except for RCMs/ Dy.RCMs /Lead Engineer/Area in charge) with prior approval from OWNER and they should have a minimum of 7 years of experience.

Notes:

1. CONSULTANT shall deploy adequately qualified personnel as per the project requirement.
2. It should be noted for all the categories mentioned above, resumes of only those personnel should be proposed by the CONSULTANT to OWNER who have a minimum of 5 years of service left.
3. Key positions of RCM, Deputy RCM, lead engineers and area I/C shall be consultants' permanent employees on their rolls. Deployment of Engineer category manpower may be

allowed through CONSULTANT's Affiliate / Subsidiary company / Subsidiary of Consultant's Holding Company. Deployment of manpower may also be allowed through CONSULTANT's empaneled agencies up to 60% of Engineers deployed at site in each discipline and on specific approval from BPCL. Details of proposed manpower with resume shall be submitted to BPCL before deployment and may be interviewed by BPCL before approval.

4. Administrative/Ministerial Staff shall be deployed as per consultant's requirement for proper and effective discharge of contractual duties, responsibilities and deliverables and the same shall be deemed to be included in the quoted rate of other technical personnel. Only Technical personnel as mentioned above shall be paid as per actual deployment.
5. No additional cost shall be payable towards travel, lodging & boarding, etc. by BPCL.
6. Bidder will be responsible for all liabilities towards corporate tax, personal income tax etc. (except GST for their personnel deputed).
7. Tax(es) as per Government policy shall be deducted at source by Purchaser while making payments against each invoice.
8. Requirement of Employment Visa for Foreign Nationals: All foreign nationals coming to India for execution of Projects / Orders will have to apply for Employment Visa only and that grant of Employment Visa would be subject to strict adherence of following norms;
 - a) Employment Visa is granted only for the skilled and qualified professional or to a person who is being engaged or appointed by a company, organization, Industry or undertaking etc. in India on contract or employment basis at a senior level, skilled position such as technical expert, senior executive or in managerial position etc.
 - b) Request for employment Visa for jobs for which large number of qualified Indian are available, is not considered.
 - c) Under no circumstances an Employment Visa is granted for routine, ordinary secretarial / clerical jobs.
 - d) Bidders are advised in their own interest to check latest Visa rules from Indian Embassy/ High Commission in their country in case foreign nationals are required to be deputed to India during execution of the Order.

3.21 The quoted Man Month rate shall be inclusive of all costs of the personnel (including but not limited to wages/salaries , compensations, allowances, benefits, medical , taxes, travel and accommodation expenses, mobilization & de-mobilization, all travel to and fro site and

Consultant's office, escalation in material prices , overheads & profits and other costs thereto as are paid to employees), all office equipment, rental of third party office equipment, computers communications equipment, communication charges (including those incurred by OWNER while in CONSULTANT's offices), all administrative costs of CONSULTANT's operation (including home office, site office and any other office), all reproduction and graphic costs of whatever kind, postage and courier expenses, all insurances including Bidder's personnel and third-party insurance, income tax, any other taxes & duties, Cess, corporate tax (as may be applicable), etc. and all other incidental charges, but excluding GST which will be paid extra by owner.

3.22 The Offer from Foreign bidders shall be inclusive Indian Income Taxes (withholding tax). In case India has a Double Taxation Avoidance Agreement (DTAA) with the foreign country (country of the bidder), the bidders can claim the benefit under such DTAA by providing the following documents:

- (1) Permanent Account Number (PAN) or details in lieu of PAN as per Indian Income Tax requirement,
- (2) Tax Residency Certificate (TRC) from govt. of foreign country
- (3) Form No.10F electronically generated from Income Tax portal
- (4) No Permanent Establishment declaration.

In case the Bidder fails to submit these documents, benefit of DTAA shall not be provided. In case quoted prices of Bidder are net of withholding tax, then the quoted prices shall be loaded for withholding tax based on the percentages worked out above for evaluation.

3.23 The price quoted shall be firm without any variation up to another 18 (Eighteen) months from the date of contractual completion of the Project.

3.24 The quantity mentioned in the price schedules shall be considered for evaluation. However, payment shall be made for the actual utilization only.

(STAMP AND SIGNATURE OF
TENDERER)

FORM-2: PRICE SCHEDULE FOR MAN-MONTH RATES WHICH SHALL BE CONSIDERED FOR PRICE BID EVALUATION

Sl No	Category of Personnel	Qty for evaluation (A)	UOM	Currency of quote (INR/USD/EURO)	Unit rate in figures and words (B)	Total amount in figures and words (A * B)
2A	Man-Month rate for Resident Construction Manager (RCM)	16	Man Months		In Figures:____ In Words:____	In Figures:____ In Words:____
2B	Man-Month rate for Deputy Resident Construction Manager (Dy- RCM)/Area I/C- Coordinator	90	Man Months	(Same as above)	In Figures:____ In Words:____	In Figures:____ In Words:____
2C	Man-Month rate for Site Engineers for various disciplines and other Officers for HSE, Stores Management, etc.	300	Man Months	(Same as above)	In Figures:____ In Words:____	In Figures:____ In Words:____

NOTES:

1. Bidder to quote strictly as per the above PROFORMA.
2. The above Man – Month Rates shall be inclusive of taxes & duties including income and withholding taxes, Cess, travel & related expenses and other levies at prevailing rates, but excluding GST as applicable, which shall be paid by the Owner on production of suitable document.
3. Administrative/Ministerial Staff shall be as per bidder's requirement and included in the quoted rate of technical personnel (Sl 2A, 2B & 2C of form 2). Only Technical personnel as mentioned above shall be paid as per actual deployment.

(STAMP AND SIGNATURE OF TENDERER)

4.0 PREAMBLE FOR PER-DIEM / MANDAY RATE

A. PREAMBLE FOR PER-DIEM / MANDAY RATE FOR VISITS TO FOREIGN COUNTRIES (OTHER THAN INDIA) EXCLUSIVE OF TRAVEL AND RELATED EXPENSES

- 4.1 The payable calendar days are for the duration of stay in foreign nations for visiting Licensor, supplier, package vendor etc. in connection with discussions with Licensor, HAZOP, Review & Approval of engineering drawings, follow-up etc., plus two days total travel time (to cover travel both ways).
- 4.2 The per-diem rate shall be applicable for 8 working hours excluding lunchtime, tea breaks and local travel time and shall be applicable for all working days, holidays and Sundays if spent at work as directed by BPCL. For more than 8 working hours, payment shall be made on pro-rata basis.
- 4.3 The per-diem rate is exclusive of lodging & boarding and to & fro air fare (economy class). The charges mentioned above shall be paid at actual against documentary evidence.
- 4.4 No medical expenses or any other expenses incurred by the Consultant's personnel during the visit shall be borne by the Owner.
- 4.5 For Foreign Travel:

The owner shall provide the following for each personnel deputed by consultant.

- i. Cost of Travel: Fare Charges in class of entitlement, Airport Tax and Visa
 - ii. Cost of local transport, hotel accommodation and living expenses at actuals subject to a ceiling as per guidelines of Ministry of External Affairs, Govt. of India
- 4.6 The price quoted shall be firm without any variation up to another 18 (Eighteen) months from the date of contractual completion of the Project.
- 4.7 The per-diem rate shall be applicable on works carried out by the Consultant for any overseas services as per BPCL's project requirement. However, all overseas services/ travel shall be executed as per the requirement of BPCL with prior written consent of BPCL.
- 4.8 Technical Personnel (Engineer/Expedition/Purchase officer) proposed by Bidder for deployment at site for performance of above services should be adequately qualified (Graduate in Engineering for Engineer and Graduate for Expedition and Purchaser officer) & have the experience of min. 7 years in execution of projects in their respective field.

4.9 The quantity mentioned in the price schedules shall be considered for evaluation. However, payment shall be made for the actual utilization only.

B. Price schedule for Per diem / Manday rate for performing additional services other than tendered scope (if any) all-inclusive with travel and related expenses, Form - 3

4.10 The per-diem / Manday rate shall be applicable on works carried out by the consultant / Home office services extra to the tendered scope as per requirement of BPCL. However, all services/ travel shall be executed as per the requirement of BPCL with prior written consent from BPCL.

4.11 The per-diem rate is inclusive of all travel & associated expenses such as to & fro air fare, lodging, out-of-pocket expenses, local transport and other such travel expenses.

4.12 The per-diem rate shall be applicable for 8 hours excluding lunch & tea break time. For more than 8- hour, payment shall be done on pro-rata basis.

4.13 For visits within India travelling time will not be considered for reimbursement.

4.14 The per-diem rate shall be applicable for all working days, holidays and Sundays if spent at work as directed by BPCL.

4.15 The quantity mentioned in the price schedules shall be considered for evaluation. However, payment shall be made for the actual utilization only.

(STAMP AND SIGNATURE OF
TENDERER)

FORM-3: PER-DIEM / MANDAY CHARGES WHICH SHALL BE CONSIDERED FOR TOTAL PRICE BID EVALUATION

Sl No	Category of Personnel	Qty for evaluation (A)	UOM	Currency of quote (INR/USD/ EURO)	Unit rate in figures and words (B)	Total amount in figures and words (A*B)
3A	Per diem / Manday rate for visits in foreign countries (Other than India) exclusive of travel and related expenses for Process Engineer/ Mechanical Engineer/ Specialists – Piping, Rotating & Static Equipment, metallurgy, Inspection Engineers, Instrument and Electrical Engineer/Expeditior/purchase Officer, etc.	80	Mandays		In Figures:_____ In Words:_____	In Figures:_____ In Words:_____
3B	Per diem / Manday rate for performing additional services other than tendered scope (if any) all-inclusive with travel and related expenses for Process Engineer, Mechanical Engineer/ Specialists Piping, Rotating & Static Equipment, metallurgy, Inspection Engineers, Civil, Instrument and Electrical Engineer, Expeditior/purchase Officer etc.	1000	Mandays		In Figures:_____ In Words:_____	In Figures:_____ In Words:_____

NOTES:

1. Bidder to quote strictly as per the above PROFORMA.
2. The above Manday Rates shall be inclusive of taxes & duties including income and withholding taxes, Cess, but excluding GST as applicable, which shall be paid by the Owner on production of suitable document.

(STAMP AND SIGNATURE OF TENDERER)

5.0 EVALUATION CRITERIA OF THE BIDS

1. Evaluation shall be carried out considering the sum of price quoted in Form 1, Form 2 and Form 3 with applicable GST and after considering Input Tax Credit available to BPCL. Rate quoted will be multiplied by quantity in Form-2 and Form-3 for calculating total amount in these forms.
2. The bidder with overall lowest quoted price (L-1) shall be considered for award of work.
3. For foreign bidders, offers shall be evaluated considering exchange rate published by RBI on the date of opening of the price bids. In the absence of RBI reference rate, SBI TT (Telegraphic Transfer) reference rate will be considered.
4. Techno-Commercial Loading (if any) shall be considered for evaluation.
5. Any other Taxes and Duties as applicable shall be considered for evaluation.
6. Loading if any on commercial deviation shall be considered by BPCL while evaluation which shall be intimated to the Bidder.

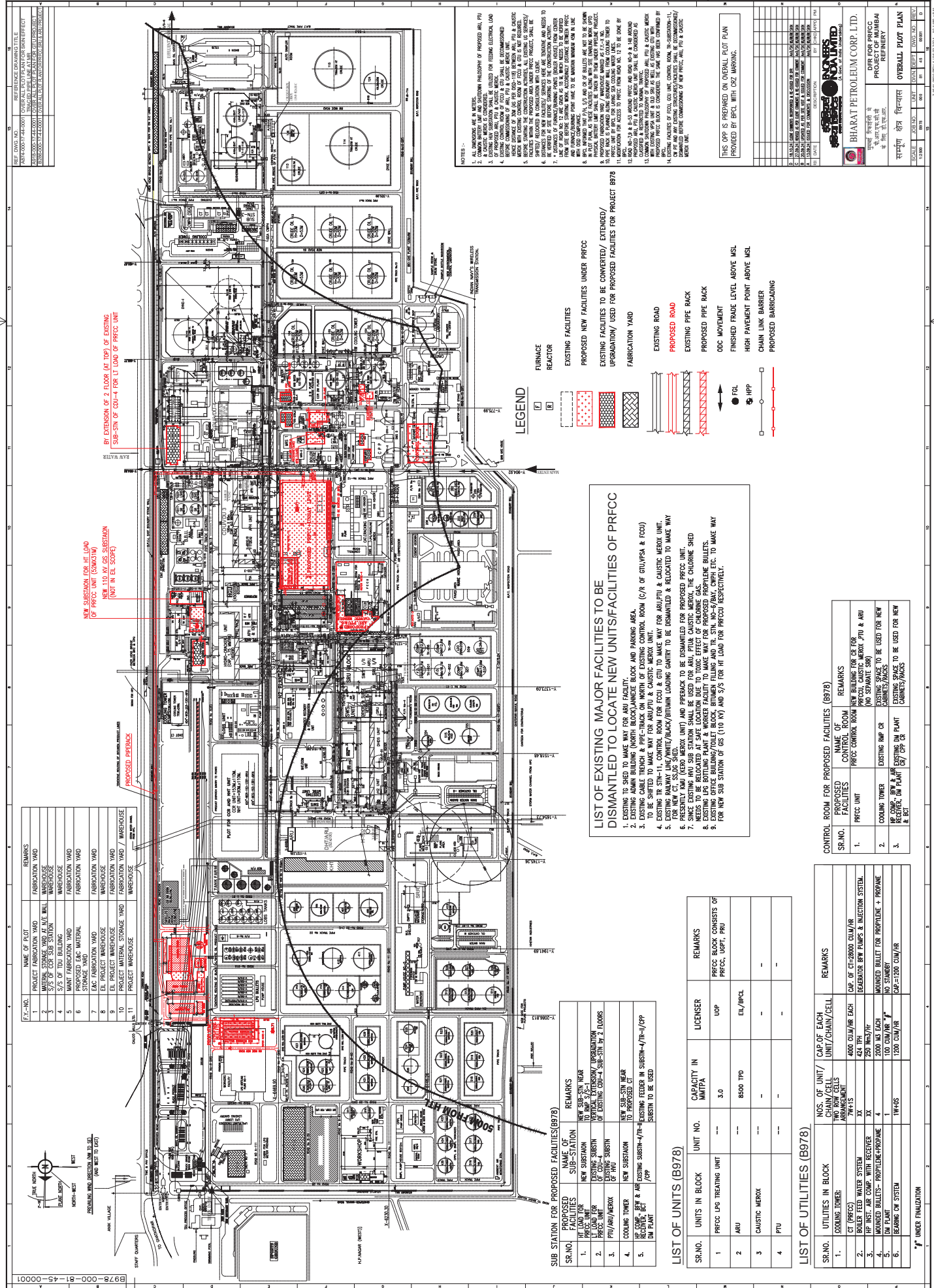
6.0 Price Variation Clause:

Price Variation on account of delay in completion for reasons not attributable to consultant:

The price quoted shall be firm without any variation up to another 18 (Eighteen) months from the date of contractual completion of the Project. In case the actual completion extends beyond the stipulated date (18 (Eighteen) months from the date of contractual completion of the project) for reasons not attributable to Consultant, Consultant shall be entitled to an escalation on the quoted man-day and man-month (entitled as per Preamble for Man month rates) rates as specified below:

Base rate will be 18 (Eighteen) months from the date of Contractual Completion. Escalation will be calculated based on % change in "Consumer Price Index (CPI) Numbers for Industrial Workers - All India", published by the Reserve Bank of India between the above date and the date of actual services.

Lumpsum price other than reimbursable Man-day/Man-Month efforts shall remain firm till completion without any escalation.



SR.NO.	UTILITIES IN BLOCK	NOS. OF EACH UNIT/CELL	CAP. OF EACH UNIT/CHAIN/CELL	REMARKS
1.	COOKING TOWERS	ARMED SHELLS	4000 CUM/HR	CAP. OF CI-20000 CUM/HR
2.	CI (PREFC) COOKING SYSTEM	7MM SHELLS	2500 M3/HR	GRABATOR BFW PUMPS & INJECTION SYSTEM.
3.	CI INST. AIR COMP. WITH RECEIVER	XX	200 M3/HR	ARMED BULLET FOR PROTECTIVE + PROPANE
4.	ARMED BULLETS - PROTECTIVE + PROPANE	XX	200 M3 EACH	NO STAMPER
5.	DM PLANT	100 CUM/HR	100 CUM/HR	CI CAP-2000 CUM/HR
6.	BEARING ON SYSTEM	100 CUM/HR	100 CUM/HR	

CONTROL ROOM FOR PROPOSED FACILITIES (9978)			
SR.NO.	PROPOSED FACILITIES	NAME OF CONTROL ROOM	REMARKS
1.	PRECIP UNIT	PRECIP CONTROL ROOM	NEW BUILDING FOR CR FOR PRECIP, CAUSTIC MEXO, PTU & ADU (ON SEPARATE SIBS)
2.	COOLING TOWER	EXISTING RMP CR	TO BE USED FOR NEW CABINETS/RACKS
3.	HP COMP., BFW & WATER, DM PLANT	EXISTING DM PLANT CR	EXISTING SPACE TO BE USED FOR NEW CABINETS/RACKS

S.No.	DATE	DESCRIPTION	BY
		 भारत पेट्रोलियम कॉर्पोरेशन लिमिटेड BHARAT PETROLEUM CORP. LTD. (A Govt. of India Undertaking)	
		मुम्बई रिफायनरी मे “से.आर.एच.सी.” के लिए हो.प्लान.	DFR FOR PRFCC PROJECT OF MUMBAI REFINERY
		सम्पूर्ण क्षेत्र विन्यास	OVERALL PLOT PLAN