

**Tender Document**

**For**

**Construction for Capacity**

**Augmentation work of CPF, Bhaskar**

**Field**

**Tender No.: SunPetro/Bhaskar/Capacity Augmentation/2023-24/SPPL-153**



**SUN PETROCHEMICALS PRIVATE LIMITED**  
**(SunPetro)**

**8<sup>th</sup> Floor, ATL Corporate Park, Opp. L&T Gate no. 7,  
Saki Vihar Road, Chandivali, Powai,  
Mumbai – 400072**

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## **SECTION- 1**

### **INVITATION TO BID (ITB)**

## **Sun Petrochemicals Private Limited**

### **Commercial & Supply Chain Management**

8th Floor, ATL Corporate Park, Opp. L&T Gate no. 7,  
Saki Vihar Road, Chandivali, Powai, Mumbai – 400072

[www.sunpetro.com](http://www.sunpetro.com)

CIN: U24219GJ1995PTC028519

Ref. No. SunPetro/Bhaskar/Capacity Augmentation/2023-24/SPPL-153

Date:16.10.2023

### **INVITATION TO BID (ITB)**

**Sub: Construction for Capacity Augmentation work of CPF, Bhaskar Field**

### **Tender No :- SunPetro/Bhaskar/Capacity Augmentation/2023-24/SPPL-153**

Dear Sir / Madam,

- 1.0** Sun Petrochemicals Private Limited (hereinafter referred to as SunPetro / Company) is pleased to invite you to submit the Bid for the subject tender in accordance with the requirements & details as stated in the Tender Document, under TWO ENVELOPE SINGLE STAGE BIDDING SYSTEM in following two Envelopes:

**ENVELOPE-I: Technical & Un-Priced Commercial Bid**

**ENVELOPE-II: Priced Commercial Bid**

Bidders are requested to read the instructions and requirements in the Tender Document carefully and accordingly to submit the Technical & Un-Priced Commercial Bid in one envelop and Priced Commercial Bid in another envelop as stated above, each in a separate wax sealed envelope. Both envelopes are required to be placed in one wax sealed envelope and be send to the tendering office address. Bids should be complete in all respects, as per the requirements of the relevant Sections & Annexures.

#### **1.1 SALIENT FEATURES OF THE TENDER**

1]	Tender No.	SunPetro/Bhaskar/Capacity Augmentation/2023-24/SPPL-153
2]	Title of Tender	Construction for Capacity Augmentation work of CPF, Bhaskar Field
3]	Brief Scope of Work	Detailed as per Section - 4 of Tender Document.
4]	Tender Fee	Not Applicable
5]	Bid Security / Bid Bond	Bidders are required to furnish Bid Bond along with Technical & Un-priced-Commercial Bid in ENVELOPE-I in the format as attached herewith at ANNEXURE-2 drawn from a Nationalised/ Scheduled bank as listed at ANNEXURE-9 for an amount as specified below: <b>1. Indian Bidder: Rs.5,00,000/- (Rs. Five Lakh Only)</b> Note : 1] In lieu of bid bond bidder can also submit DD /Pay order. DD / Payorder shall be governed by Bid Bond terms and conditions. DD / Pay order to be issued in the name of <b>Sun Petrochemicals Pvt. Ltd., payable at Mumbai.</b>
6]	Bid Validity	One Hundred and twenty (120) days
7]	Bid Bond Validity	One Hundred and fifty (150) days
7]	Last Date of Receipt of Queries From Bidders	Seven (7) days from the date of issue of this ITB
8]	Date of Pre-Bid Conference & Venue	If required, shall be held and schedule will be intimated



9]	Tender Closing Date & Time	30.10.2023 at 1500 hrs. IST
10]	Address for Correspondence /Tendering Office	Head –Commercial & SCM Sun Petrochemicals Pvt. Ltd. 8 <sup>th</sup> Floor, ATL Corporate Park, Opp L&T Gate no. 07, Saki Vihar Road, Powai, Mumbai-400072 E-mail: <a href="mailto:dheeraj.paroch@sunpetro.com">dheeraj.paroch@sunpetro.com</a>
12]	Delivery Period / Work Completion time	Within 6 months from date of LOI. However, Bidder shall quote for the best possible delivery period.
13]	Terms & Conditions of Contract	As per Section-3 of this tender Document
14]	Contract Period	The term of Contract shall be for a period of 1 year with provision for extension at same terms and condition for further period of 1 year. The prices shall be firm for 1 year.

**NOTE:**

Receiving the tender from Company does not qualify the bidder automatically for their bid consideration. The bidder has to qualify tender terms & conditions including Bid Evaluation Criteria (BEC) described in the tender.

**1.2. ACKNOWLEDGEMENT OF TENDER DOCUMENT**

Bidder(s) receiving this 'Invitation To Bid' are required to confirm in writing whether they intend to bid or not within two days from electronic issue of this document, stating the reasons if declining to bid in this instance. Bidders not conforming to this requirement risk being barred from future inquiries.

**1.3. PRICING STRATEGY**

Bidder is to quote strictly as per the 'Price Schedule' (Section-8) of this Tender document.

**1.4 EVALUATION STRATEGY**

Evaluation of Bids for awarding will be based on the most advantageous offer to SunPetro reflecting a combination of technical acceptance, qualification as per Bid Evaluation Criteria (BEC) as per Section-6 and Cost.

However, Company reserves the right to reject or accept, in whole or in part, any Bid; waive formalities in the bidding processor to negotiate Contract terms with any individual bidder when such is deemed fit by Company to be in their best interest. Company will be under no obligation to provide reasons for accepting or rejecting any Bid.

**1.5 AWARD STRATEGY**

Single Award or Multiple awards will rest with SunPetro's discretion.

**1.6 CHECK LIST**

Bidders should review and submit the check list (as per format at Annexure #3) along with bid in the ENVELOPE-I (**Technical & Un-Priced Commercial Bid**).

**1.7 SUBMISSION OF BIDS**

Your wax sealed bid (ENVELOPE-I and ENVELOPE-II), complete in every respect & strictly in accordance with the Terms & condition in the Tender Documents, are to be submitted through one waxed envelope containing both envelopes as described above, at the reception of "Tendering Office" as detailed above, on or before Due date of Submission.

**1.8** Bidders to note that Non-compliance with the bidding instructions, except as permitted in the Bid and/or late arrival of Bid shall result in Bid not being considered.

- 1.9** Only bids submitted by bidders who have been issued bid document by the Company shall be considered whereas unsolicited bid shall not be considered.

Further details are available in the Tender Document for the compliance.

Please acknowledge the receipt of the tender document per Annexure#1 within 3 days from date of this ITB.

We look forward to receive your bid complete in all respect on or before due date and time of bid submission.

Regards,

**Dheeraj Paroch**  
**Head-SCM & Commercial**

## **SECTION – 2**

### **INSTRUCTIONS TO BIDDERS**

## INSTRUCTIONS TO BIDDERS

### **General Instructions**

- 2.1.1 Bidders must review the General Conditions of the Contract (GCC) and Detailed Scope of Work /Supply and specifications as per Tender, besides Bid evaluation Criteria, Responsibility matrix, commercial aspect, Schedule of Rates /Bill of quantity and other information in the Tender document.
- 2.1.2 Bidders shall be deemed to have understood and considered all the terms and conditions prescribed in the Tender Document. Any exceptions/deviations, including those pertaining to Clauses affecting prices must be clearly stated ONLY in the format provided in *Annexure#4*. However, in case no exceptions/deviations are made / taken by the bidder, Bidder must return the form marked "Not Applicable".
- 2.1.3 Bids from agent / agent's representatives will not be accepted, unless backed by valid Letter of Authorization from the bidder's Company.
- 2.1.4 Bids submitted by fax / email will summarily be rejected. Responsibility for the timely delivery of the Bid package before the Bid Due Date rests solely with the Bidder.
- 2.1.5 All prices and terms and conditions should be valid for entire period of Contract Period as well as extension period if any.
- 2.1.6 SunPetro may further place repeat order for any or all the material/services/equipment at the same rates, terms and conditions for the other fields and offices which SunPetro may acquire or associates in future.
- 2.1.7 The complete bid along with price Bid shall be duly signed and sealed by the Authorized Representative of the Bidder.

### **2.2 Joint Venture / Consortium Bidder's Bid**

- a. In case of a joint venture / consortium bid, the members / partners of joint venture / consortium must meet the qualification criteria jointly as specified.
- b. The overall responsibility of the Contract Management shall be of Lead member / partner of Joint Venture / Consortium.
- c. In case of Joint venture / Consortium Bid, following additional requirement must also be satisfied:
  - i) Indian bidders whose proposal for technical collaboration / Joint Venture / consortium involves foreign equity participation / or payment of royalty and / or a lump-sum for technical know-how and wherever Govt. approval is necessary on their application submitted to SIA (Secretariat for Industrial Assistance), are required to submit:
    - A copy of Govt. approval, along with techno-commercial bid (if already granted).
    - OR
    - Furnish an undertaking to submit a copy of the required approval prior to the date of price bid opening.
  - ii) Bidders should submit a Memorandum of Understanding (MOU) / Agreement with their technical collaborator / joint venture / consortium partner (in case of Joint venture) clearly indicating their roles and responsibility under the scope of work.
  - iii) MOU / Agreement concluded by the bidder with technical collaborator / joint venture / Consortium partner (in case of joint venture), should also be addressed to Sun Petro, clearly stating that the MOU / Agreement is applicable to this tender and shall be binding on them for the entire currency of period of Contract / PO. Notwithstanding the roles and responsibilities of each partner defined in the MOU / Agreement, all the partners will be jointly and severally responsible for completion of job under this contract.

A statement to this effect shall be included in the authorization / nomination/ MOU / Agreement by all members / partners of JV / consortium.

### 2.3 Use of English Language

All correspondence, documentation and drawings shall be in the English Language.

### 2.4 Late Bids

Company reserves the Right to reject / accept the bid submitted after the deadline for submission of bids, prescribed by the Company.

### 2.5 Clarifications

Bidders must seek any clarifications with respect to the Tender Document after tender issue date and till the date mentioned in the schedule of tendering. Any clarifications required to be sent to the following email: [dheeraj.paroch@sunpetro.com](mailto:dheeraj.paroch@sunpetro.com); [saurav.chamoli@sunpetro.com](mailto:saurav.chamoli@sunpetro.com)

### 2.6 Submission of Bids

2.6.1 A two-Envelope single stage International Competitive Bidding (ICB) system, i.e. "Technical & Commercial Un-priced Bid" and "Commercial Priced Bid" shall be followed.

2.6.2 Bids are to be submitted in duplicate i.e. two (2 copies each) of "Technical & Un-Priced Commercial Bid" and "Priced Commercial Bid" in the separate sealed envelopes as follows:

#### **ENVELOPE-I: Technical & Un-Priced Commercial Bid**

#### **ENVELOPE-II: Priced Commercial Bid**

2.6.3 The Technical & Un-Priced Commercial Bid shall contain all details but with the price column of the Price Schedule Format blanked out. However a Tick mark (✓) shall be provided against each item of the Price Schedule Format to indicate that there is a quote against that item in the Commercial Priced Bid.

The Priced Commercial Bid shall contain only prices duly filled in as per the price schedule format.

Bids which Technical & commercial Un-Priced Bid is containing prices shall be rejected.

2.6.4 Each of the "Technical & Un-Priced Commercial Bid" and "Priced Commercial Bid" shall be properly identified as "Original Technical & Un-priced Commercial Bid" & "Copy Technical & Un-Priced Commercial Bid" and "Original Priced Commercial Bid" & "Copy Priced Commercial Bid".

2.6.5 The "Original Technical & Un-Priced Commercial Bid" along with one more "Copy of Technical & Un-Priced commercial Bid" with price deleted commercial copy shall be submitted in a separate sealed envelope (ENVELOPE-I) by pasting "Cut out slip as per **Annexure # 5**". The same procedure shall be adopted for submission of the "Original Priced Commercial Priced Bid" and "Copy of Priced Commercial Bid" in separate envelope (ENVELOPE-II) by pasting "Cut out slip as per **Annexure # 6**". Each Bidder will submit two soft copies of complete signed and stamped "Technical & Un-Priced Commercial Bid in the **Flash Drive, in PDF format** along with "**Technical & Un-Priced Commercial Bid**" in the sealed cover i.e. ENVELOPE-I. Also **Bid Security / Bid Bond** should be submitted in the ENVELOPE-I with "**Original Technical & Un-priced commercial Bid** "

2.6.6 The entire Bid i.e. ENVELOPE –I and ENVELOPE –II should be then placed in a cloth-lined outer envelope duly sealed by pasting cut out slip as per **Annexure #7** and superscripted as prescribed.

2.6.7 The Bids shall be submitted to the following address:  
Dheeraj Paroch, Head - SCM  
SUN PETROCHEMICALS PRIVATE LIMITED  
8<sup>th</sup> Floor, ATL Corporate Park, Opp L&T Gate no. 07,  
Saki Vihar Road, Powai, Mumbai-400072

2.6.8 The Technical & Un-priced Commercial Bid of the Bidder will be opened and evaluated first. If the offer is technically & commercially acceptable or acceptable alternatives to the minimum requirements specified in the Tender; and conforms to technical and commercial requirement

or as may be decided by the Company, then the “Commercial Priced Bid” will be opened and evaluated.

2.6.9 In the Technical & Un-Priced Commercial Bid all the technical annexures should be submitted which would include compliance with Technical Specifications and all Price information should be left blank The Commercial part should be a comprehensive package which should include all Price information as well as “Technical” bid information.

2.6.10 Bidder will provide the Delivery Period / Mobilisation Period / Completion Period, as required in tender document from the date of NOA.

## **2.7 Validity Period**

The Bids shall be valid for acceptance for a period of **One Hundred & twenty (120) days** from the Bid Due Date of submission. Company, however, reserves the right to seek extensions of the validity period as may be required. In the event of extension of the validity period of the Bid, all other terms and conditions including the provisions relating to Bank Guarantee shall also continue to be valid for the period of such extension.

## **2.8 Technical Proposal Requirement**

2.8.1 The Bidder must adhere to the Technical Specification requirements as mentioned in the Tender. The Bidder shall confirm in its Bid Proposal that it has sufficient experience and resources to meet the scope of work of subject tender. The Bidder is to satisfy Company regarding Bidder’s capabilities and experience by submitting the documents, certificates, resumes etc as defined in the Scope of Work, Contractor’s personnel and as required under any clause in particular.

2.8.2 The Technical Bid should contain brochures of the products, details of experience with other Operators / companies in India / abroad of similar services, performances, etc.

## **2.9 Certificate & Inspection**

At any time prior to supply / execution of the contract or during the course of delivery/completion and thereafter, Company shall have the right to access materials and Supplier shall assist in the verification of material test certificates & inspections. The Company shall exercise reasonable judgement in acceptance or rejection of such verifications, but Company reserves all the rights conforming to the requirements of the contract. It will be the Bidder’s responsibility to correct any deviations from specifications found by inspection prior to mobilization of equipment. This will be at the cost of the Bidder / contractor.

## **2.10 Commercial Proposal Requirements**

### **2.10.1 Currency**

Prices quoted shall be in Indian Rupee (INR).

### **2.10.2 Price in Words & Figures**

In case of discrepancy between words and figures, the advantage in favour of Company will apply.

### **2.11 Deadline for Submission of Bids**

The due date mentioned in the “Invitation to Bid” (ITB) shall be deadline for submission of bids. In case of the unscheduled holiday in Mumbai, (India) being declared by Company on the prescribed closing day of the tender, the next working day will be treated as the scheduled prescribed day of closing of the tender.

### **2.12 Splitting of work**

The Company shall have a Right to split the work /supply between two or more bidders at its sole discretion.

### **2.13 Payment Terms**

Compensation to the Bidder shall be made as per the prices quoted and in accordance with terms of the payments as may be finalized with Bidder and stipulated in the LOI / Contract. Invoices shall be raised & un-disputed invoice / items shall be paid based on approved “Call out” orders /

Purchase Orders for each Service/Supply. No payment will be due to the Contractor / Supplier prior to signing of the Contract.

## **2.14 Taxes, Duties and Approvals**

2.14.1 The Bidders shall quote their prices inclusive of any or all taxes and duties that are applicable including transport, insurance on a CIF basis at the designated port of delivery or Site Location in India. Except GST (if applicable), the prices shall reflect delivery inclusive of all applicable fiscal charges including but not limited to taxes, fees, duties, cess, licenses, import duties, personal income tax, corporate tax, excise tax and similar rates and fees, freight, insurance, and similar expenses. GST, if applicable, shall be paid by the Company at actual.

2.14.2 Bidder shall consider in their bid and shall be responsible to obtain at its own cost, all required Permits / Consents / Essentiality Certificates (EC) to avail concessional / Nil duties & taxes applicable for the field, wherever applicable and required for the performance of the Bidder's obligations under the Contract, from the Government of India/ concerned State Governments, authorities or agencies or political sub-division thereof including any for exemption of custom duties (as per **Annexure #10**) and other duties on material / equipment imported into India. Company will provide reasonable assistance wherever required including obtaining all certificates including Essentiality Certificate for claiming Zero Custom Duty as applicable under PSC, but all expenses related to obtaining all such Permits, Consents etc. shall be to the Bidder's account.

## **2.15 Performance Bank guarantee**

The Successful bidder shall furnish to Company, a Performance Bank Guarantee for 10% of the estimated Contract value within 15 days of issue of the LOI / Contract (whichever is earlier) in the format as given in **Annexure #8** from any of the nationalised or scheduled private banks as listed in the tender document **Annexure #9**. If the bidder does not submit the Performance Bank Guarantee as stipulated above, SunPetro reserves the Right to take appropriate measures to secure the interest of the Company and right to cancel the award of LOI without thereby holding / incurring any liability towards bidder for any work / material / services already done / provided by the bidder / supplier.

## **2.16 Change Orders & Rates:**

2.16.1 Company shall have the right to make changes, including additions to or deletions from the quantities originally ordered or in the specifications. A checklist for post award of work is placed at **Annexure #11**. The quoted and finally negotiated rates shall be valid & firm from issue date of LOI up to the completion of the contract.

2.16.2 Company will issue written orders to Bidder for any change or extra work, except in the event of an emergency which in the opinion of Company requires immediate attention, Company will also be entitled to issue oral orders to the Bidder for any work required by reason of such emergency. Company shall ensure that such oral orders shall be followed up with written communication.

2.16.3 All changes in quantities / specifications will be performed at a mutually agreed delivery Schedule in the Contract period and price of such works shall be finalised / derived in terms and rates elsewhere in the Contract documents.

2.16.4 For any additional goods/service , not specified herein, but needed for operations, the Bidder shall be required to provide, on agreed time, these additional goods & services, at agreed cost or actual costs + 5% handling fees.

## **2.17 Mobilization Period / Delivery Period / Completion Period**

Time is essence of the Contract and Contractor shall Supply / perform the Work and Services diligently in accordance with the Bidder's **promised delivery dates / Mobilisation period / Installation period / Completion Period as set forth in Delivery schedule or agreed for any additional work / services / Supplies**. In the event it becomes apparent that the delivery date cannot be met, the Contractor shall, at its own cost, take all necessary steps to expedite the process, failing which the provisions of Liquidated Damages as specified in the Contract shall be applicable. The Company may also terminate the LOI or Contract immediately invoking the available remedies for protecting the interest of the Company. Company will have the right to reject any bid not meeting the delivery schedule / Mobilization time.

## **2.18 Bid Bond**

Bid Bond /EMD to be submitted along with ENVELOPE-1. The Bid Bond /EMD shall be returned to all unsuccessful bidders within one month after completion of tendering process (however , in case of the successful bidder , Bid Bond will be returned after submission of Performance Bond and failure to submit Performance Bond will lead to forfeiture of Bid bond)

**2.19 Annexures**

Please note that **all Annexures are placed at the end of this document**



## **SECTION-3**

### **MODEL CONTRACT**

- **Preamble of the Contract**
- **General Conditions of the Contract (GCC)**

## PREAMBLE OF THE CONTRACT

**THIS AGREEMENT**, is made this \_\_\_\_\_ day of \_\_\_\_\_ 2023

### BY AND BETWEEN

Sun Petrochemicals Pvt. Ltd. a company organised and existing under the laws of India and having its office at 8th Floor, ATL Corporate Park, Opp. L&T Gate no. 7, Saki Vihar Road, Chandivali, Powai, Mumbai – 400072 (hereinafter referred to as “**Company**” or “**SunPetro**”)

AND

[NAME OF CONTRACTOR], a company organised and existing under the laws of [.....] and having its head office at [.....] (Hereinafter referred to as “**Contractor**”)

### RECITALS

**WHEREAS**, Company desires to have certain Services as hereinafter specified

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**WHEREAS**, Contractor represents that it possesses the necessary premises, equipment, personnel and capability to carry out such Services and is willing to do so on the terms and conditions hereinafter contained;

Hereafter both Company and Contractor shall be called jointly as Parties.

**WHEREAS**, Company desires to engage Contractor to design, supply, perform and complete the Services and

**WHEREAS**, Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter contained.

**NOW, THEREFORE**, in consideration of the mutual covenants herein contained, it is hereby agreed between the Parties as follows:

This Contract witness that in consideration of the premises and the payment to be made by the Company to the Contractor provided for herein the Contractor shall supply all equipment and /or materials and execute and perform all Services /Supply strictly according to the SCOPE OF WORK (SECTION-4) various provision in tender schedule and upon such supply, execution and performance of services to the satisfaction of the Company, the Company shall pay to the Contractor at the rates accepted as per the said tender schedule (Attached at SECTION-7) and in terms of the provisions therein.

The following documents, in order of precedence descending, comprise the entire Contract between the parties:

- 1] This Preamble of Contract
- 2] Articles of Contract (General Terms and Conditions)
- 3] Special Terms & Condition of Contract
- 4] Scope of Work (Specifications and Scope of services)
- 5] Annexures

The salient features of the Contracts as detailed herewith highlighted for ready reference:

Note 1 : Title of the Contract : .....  
 Note 2 : Contract No.: .....  
 Note 3 : Point of Delivery/Site address: .....  
 Note 4 : Project/Block Number: .....  
 Note 5 : Effective Date of the Contract: .....  
 Note 6 : Due Date of Mobilization: .....  
 Note 7 : Duration /Validity of the Contract .....  
 Note 8 : Tentative Value Of The Contract: .....  
 Note 9 : Company's Representative: .....  
 Note 10 : Contractor's Representative: .....

IN WITNESS WHEREOF, the parties have hereinto set and subscribed their respective hands and seals the day, month and year respectively set forth

**Sun Petrochemicals Pvt. Ltd.**

(COMPANY)

(CONTRACTOR)

Signature \_\_\_\_\_

Signature \_\_\_\_\_

Name:

Name:

Title:

Title:

In presence of witness

1)Name  
 Title  
 Signature/Initials

1)Name  
 Title  
 Signature/Initials

2)Name  
 Title  
 Signature/Initials

2)Name  
 Title  
 Signature/Initials

## GENERAL CONDITIONS OF THE CONTRACT (GCC)

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## GENERAL CONDITIONS OF THE CONTRACT (GCC)

### 3.1 DEFINITIONS AND INTERPRETATION

The following definitions and interpretation shall apply and shall have the meanings assigned to them in this Contract except where the context otherwise requires:

- 3.1.1 "Affiliate" of a Party means any Person, whether directly or indirectly, controlling, controlled by, or under common control with, such Party or Person, as applicable. For the purposes of this definition, the term "control" means (i) direct or indirect ownership of more than fifty percent (50%) of the equity (or such lesser percentage which is the maximum allowed to be owned by a foreign corporation in a particular jurisdiction) having the power to vote on or direct the affairs of such Party or Person, as applicable, or (ii) the power to direct decisions of such Party or Person, as applicable, including the power to direct management and policies of such Party or Person, as applicable, whether by reason of ownership, by contract or otherwise.
- 3.1.2 "Agreement" or "Contract" or "Contract Document" shall mean the instructions to the bidders mentioned in the tender document, the preamble, these contract definitions, General Contract Conditions, Special Contract Conditions, Schedule of Rates, Responsibility Matrix etc., Specifications, Scope of work, all the exhibits, annexures appendices, schedules etc. hereto along with any amendments agreed and issued subsequently.
- 3.1.3 "Applicable law" shall mean any Indian law, regulation, bylaws, rule, directive, ordinance, judicial or quasi-judicial decree, order or notification enacted, issued or modified by any Government Agency in India.
- 3.1.4 "Approved and Approval" shall mean approved or approval in writing by the Company.
- 3.1.5 "Contract Administrator" shall mean the contract administrator so appointed by SunPetro.
- 3.1.6 "Contract Price" shall mean the lump sum prices and/or rates of payment specified in Price Schedule in *Section 7* and as may be indicated in the Price schedule, which SunPetro shall compensate, Contractor for the actual work executed and certified by SunPetro's Representative subject to any additions/deletions thereto which may be made through the application of relevant provisions of the Contract.  
  
"Contract Value" shall mean the estimated value of the payments that would be made to the Contractor for the duration of the Contract for the supply & services to be provided under the Contract including but not limited to the Mobilisation Charges, Demobilisation Charges, Unit rates, cost of consumables, day rates, monthly rates, standby rates etc as applicable. This Contract Value will be the basis for calculation of Performance Bank Guarantee and other values referred to in the Contract or linked to contract value. The actual Contract Value (based on actual payment) is likely to differ from originally calculated Contract Value, however the originally calculated Contract Value will be the basis for various provisions under this Contract.
- 3.1.7 "Contract Area" shall mean various Exploration & Production Blocks and Fields as awarded to the Operator by Government of India and/or any other Block awarded to Company from time to time and as identified as "Contract Area" or where company has participatory interest.
- 3.1.8 "Certificate of Release and Final Payment" is the certificate issued by SunPetro as per the terms of Clauses mentioned herewith.
- 3.1.9 "Contractor" shall mean M/s. \_\_\_\_\_ and includes, its consortium partners, sub-contractors and vendors and the officers, directors, commissioners, employees, servants, representatives and agents of any of them as applicable.
- 3.1.10 "Contractor Administrator" shall mean the contract administrator so appointed by the Contractor and informed to SunPetro.
- 3.1.11 "Contractor's Equipment" shall mean all the equipment(s), units etc. along with auxiliary, plant, machines, spares, facilities, miscellaneous materials /services and consumables etc., provided by the Contractor or its Sub-contractors in connection with the Scope of Work specified in *Section 4*.

- 3.1.12 Contractor's Personnel" shall mean each individual and / or the collective group of Contractor's employees, Contractor's subcontractors, and their respective employees, subcontractors, licensees, invitees, agents and representatives, who are provided and/or utilized by Contractor for the performance of the Work.
- 3.1.13 "Commencement Date" shall mean the date when the Contractor's equipment / services are tested, rigged up and ready to commence operations on the designated site for working as intimated by SunPetro to Contractor.
- 3.1.14 "Completion Date" shall mean the time and date when the work is completed by the Contractor as per the Scope of Work.
- 3.1.15 "Commissioning" means commissioning of the facilities or any part thereof by the Contractor as specified in the Scope of Work / tender document. Commissioning shall be certified by the Company/Consultant and TPIA as applicable.
- 3.1.16 "Consultant" means consultant deployed by Company for project management and action as Company's engineer.
- 3.1.17 "Company" means the Company or Operator which is a party to this Contract, and any other party for whom Company is acting in executing this Contract, including but not limited to, other members of the consortium owning an interest in the Block, their or their officers, directors, agents and employees.
- 3.1.18 "Company's Equipment" shall mean all equipment, appliances, tools, parts and supplies provided by Company and / or its associates.
- 3.1.19 "Company Group" shall mean the Company, its affiliates their contractors, subcontractors and equipment vendors of any tier, its Co-ventures, their personnel, officers, directors, employees and agents but excluding Contractor Group;
- 3.1.20 "Contract", "Agreement" or "Contract Document" (as per par 3.1.2 above)
- 3.1.21 "Daily Operation Report" shall mean the daily report submitted by the Contractor to SunPetro as per the requirements of contract.
- 3.1.22 "Days" shall indicate consecutive calendar days, it being understood that all dates and time periods referred to in the Contract are expressed in terms of the Gregorian calendar. "Day" means a calendar day of twenty hours as referred to local time at the Site.
- 3.1.23 "Defect Liability Period" means the period of validity of the warranties and guarantees given by the Contractor commencing at Operational Acceptance of the facilities or a part thereof by the Company, during which the Contractor would be responsible for defects with respect to the facilities (or the relevant part thereof) as per the term of the Contract.
- 3.1.24 "Demobilization" shall mean the actual demobilization of contractor's equipment and contractor's personnel including disassembly, removal, and site cleanup & restoration of all facilities assembled on site, repair of access roads to the full satisfaction of the Company. SunPetro, will issue the de-mobilization letter for the services as and when requirement ends.
- 3.1.25 "Deviated / Directional Well" shall mean a Well drilled with the intention of being inclined from the vertical.
- 3.1.26 "Effective Date" shall be the date of issue of NOA(Notification of Award) /LOI(letter of Intent) / LOA(Letter of Award) / Work Order or as specified by Company.
- 3.1.27 "Exhibits" are those documents attached hereto and form an integral part of this Contract for all purposes and consisting of all the exhibits and annexures.
- 3.1.28 "Facilities" means the Plant and Equipment, Installation and Construction Services and related equipment and other associated works, to be carried out by the Contractor under the Contract for completion of the entire scope of work and the Contract documents, which are to be designed, engineered, procured, developed, constructed, tested, pre-commissioned, commissioned and handed over at the site to and for the Company in accordance with the terms and conditions of this Contract.
- 3.1.29 "GIPIP" shall mean specific guidelines in conformance with the Good international practices/norms and applicable standards / legislations and prevalent regulatory regime as specified by the Government of India.

- 3.1.30 “Good Oilfield Practices” means good international petroleum industry practices with such degree of diligence and prudence reasonably and ordinarily exercised by experienced parties engaged in a similar activity under similar circumstances and conditions.
- 3.1.31 “Government” shall mean Government of India or Government of State, or any political subdivision or administrative agency thereof, as the case may be, and/or their respective representatives having jurisdiction over the Work performed under this Contract.
- 3.1.32 “Gross negligence” shall mean (i) the intentional failure to perform a manifest duty, in reckless disregard of or wanton indifference to the consequences to the life, health, safety or property of others; or (ii) any act or failure to act which, in addition to constituting negligence, was in reckless disregard of or wanton indifference to the consequences to the life, health, safety or property of others.
- 3.1.33 Interpretation
- Reference to "Section", " Para " "Clause" "Article" and "Provision" shall have the same meaning.
  - The headings and sub-titles in these Conditions of Contract are included solely for convenience and shall not be deemed to be part thereof and shall not affect the meaning or operation of the Contract.
  - Words imparting the singular meaning only also include the plural and vice versa except where the context otherwise requires.
  - Any reference to statute, statutory provision or statutory instrument shall include any re-enactment or amendment thereof for the time being in force.
  - Reference to Applicable Laws shall also include amendments and extensions thereto.
- 3.1.34 “Installation and Construction Services” shall mean all such services necessary for construction of facility using the plant and equipment and including without limitations engineering design, fabrication, construction, installation, civil, building and other construction works, completion of the facilities, testing, pre-commissioning and commissioning of the facilities, inspection, site preparation works (including the provision and use of Contractor’s equipment and the supply of all construction materials required such as consumables, welding electrodes, joint coating materials, end-sleeves, casing pipes, markers, cathodic protection system), operations, maintenance, training, etc. including all such services necessary for making available supplies of Plant and Equipment at site including but not limited to transportation, loading, unloading, insurance and other local services required in relation to the supply of the said goods at site.
- 3.1.35 “Letter of Intent / Letter of Award / Notification of Award /Work Order” or “LOI / LOA / NOA/ WO” shall mean the letter of Intent or Letter of Award or Work Order issued to the Contractor by Company.
- 3.1.36 “Logging Unit” shall mean the mobile unit capable of carrying out logging and perforation services along with consumables as defined in the Scope of Work.
- 3.1.37 “Mobilization” shall mean the actual mobilization of the Contractor’s equipment which are fit for operational requirements, along with auxiliary equipment and contractor’s personnel during contract period and shall include any demurrage incurred during the period up to and including the date the Work begins at the Work Site of this Project except if such delay or demurrage has occurred due to acts or omissions of the Operator. SunPetro, will issue the mobilization letter for the services as and when requirement comes.
- 3.1.38 “Operational Acceptance” means the acceptance by the Company of the facilities (or any part of the facilities where the Contract provides for acceptance of the facilities in parts), which certifies the Contractor’s fulfilment of the Contract in respect of Functional Guarantees of the facilities (or the relevant part thereof) in accordance with the technical specifications, related provisions in GCC and related provisions in the SCC.
- 3.1.39 “Operator” shall mean Sun Petrochemicals Private Limited(SunPetro) / Company
- 3.1.40 “PSC” shall mean the production-sharing contract entered into between the Government of India and SUNPETRO consortium as its consortium.

- 3.1.41 "Project" shall mean the work and other related activities as may be indicated in the LOI/ Contract as per the Scope of Work.
- 3.1.42 "Provisional Completion/Acceptance" shall mean the certificate so issued by the Owner, subject to the fulfillment of the terms described under the SOW/tender document.
- 3.1.43 "Services" shall mean the services to be provided by the Contractor under the Contract as more particularly described in Scope of Work, to this Contract and shall include such other services as may from time to time be agreed in writing between the Contractor and SunPetro.
- 3.1.44 "Sun Petro " / "SPPL" shall mean Sun Petrochemicals Private Limited .
- 3.1.45 "SunPetro's s Representative" or "Company Representative" shall mean the person or persons expressly designated in writing by Company, who shall be Company's representative and shall be empowered to act, monitor and direct the performance of the Work required under this Contract on behalf of Company.
- 3.1.46 "SunPetro Supply Item" shall mean a supply item, which is expressly identified in the Contract as being for supply by SUNPETRO or its contractors.
- 3.1.47 "Sub-Contractors" shall mean those persons or companies engaged by the Contractor in connection with the Services / contracts approved by SunPetro.
- 3.1.48 "SunPetro Designated Base" shall mean well site as informed by Company. However, the contractor shall store/warehouse its equipment and materials at its own costs & risks.
- 3.1.49 "Performance Bank Guarantee" shall mean the unconditional, irrevocable bank guarantee required to be submitted by the Contractor to the Company in accordance with the terms of the contract and in the form of which bank guarantee is set forth in *Annexure #8* hereof.
- 3.1.50 "Rates" or "Rate" shall mean the applicable rates of compensation to be paid to Contractor for work hereunder as set forth in the Price Schedule.
- 3.1.51 "Termination Date" shall mean the time of day and date when the Term defined in contract hereof expires or when this Contract is terminated by Company, in accordance with its terms, whichever occurs later.
- 3.1.52 "Vertical Wells" shall mean a well drilled with the intention of maintaining the well bore as close as possible to 90° to the surface of the earth.
- 3.1.53 "Well" shall mean either a Vertical or a Deviated Well or horizontal well.
- 3.1.54 "Well Depth" shall mean the depth (TVD / MD) of each Well as may be specified in SunPetro's Completion Programme, which SunPetro may amend from time to time.
- 3.1.55 "Well Locations" shall mean the locations of the Wells within the Contract Area at which Contractor shall carry out operations and such other locations as may be specified by SunPetro.
- 3.1.56 "Willful Misconduct" means Intentional disregard of Good Oilfield Practice or proper conduct under the Contract with knowledge that it is likely to result in any injury to any person or persons or loss or damage of property.
- 3.1.57 "Work" shall mean the Work provided by Contractor which includes providing but not limited to tools & tackles, auxiliary equipment, spares, consumables, supplying the necessary equipment, materials, personnel and technical support etc. necessary for the performance of Services on the Work Site / Work Location or base in accordance with the scope of the work defined in the Contract.
- 3.1.58 "Work Site / Work Location" shall mean the lands and waters and other places on, under, in or through which the Works are to be carried out and any other lands, waters or places approved by the Company for the purposes of the Contract together with any other places designated in the Contract as forming part of the Site.
- 3.1.59 "Third Party" shall mean a person / entity which is not included in Company Group or Contractor Group.
- 3.2 **DURATION OF CONTRACT:**
- 3.2.1 Primary term of this contract will be 1 (One) year from the date of award with a provision to extend for 1(one) more year on same rates, terms and conditions at discretion of Company. The Contract



shall be valid for all the blocks of SunPetro in Gujarat. However, work completion date will be 6 months from the date of LOI.

**3.2.2 Commencement Date, Completion Date and Termination Date for rate applicability:**

- Commencement date : Date of Mobilization
- Completion date of contract : Expiry Date of Contract
- Termination Date : Expiry of the Contract

**3.3 Materials, Supplies, Equipment, Services And Personnel**

Any item supply / services requested by Company during contract period to complete the work shall be provided by Contractor.

**3.3.1 Additional Services, Materials, Supplies and Equipment**

If it is not a part of contract, Company will pay based on agreed cost or actual cost plus 5% handling / service charges. The proof of item prices shall be submitted in original by the contractor to the Company.

3.3.2 The Company has full right to delete any item (s) / service(s) from the contract. The pay will only affect for the quantities of item(s) / Service(s) as certified by the company's representative.

**3.4 INSPECTION OF MATERIALS**

**3.4.1 Inspection of Company Equipment**

Contractor shall have right to inspect and get satisfied on the company equipment, company will provide the full access to the contractor.

**3.4.2 Inspection of Contractor Equipment**

Company shall have the right at any time to inspect and reject for valid cause any items of equipment furnished by the Contractor for performance of the Services and Contractor shall replace, at no additional cost to Company, such items so rejected with items free from defects or if Company agrees, repair such items at Contractor's cost. All supplied shall be new & unused & shall not be more than one year old from the date of manufacture. Documentary proof shall be provided for the same. Any substandard material received/delivered at site shall be rejected outright.

**3.5 COMPANY'S WORK /COMPLETION PROGRAMME**

**3.5.1 Work Programme:**

3.5.2 Contractor to Comply with Company's Work / Completion/supply Programme. Contractor shall use all reasonable care and attention to ensure all aspects of the requirements set forth in Company's Work / Completion / supply programme which are to be provided by Contractor are complied with and to ensure that Company's other contractors are afforded all reasonable facilities to similarly comply as appropriate. Contractor shall carry out checks on any of the requirements of the Work / Completion / supply programme, as directed by Company and record and report the results of such checks to Company.

3.5.3 Not Applicable.

3.5.4 Work shall be completed as directed by SunPetro.

**3.6 PERFORMANCE OF THE WORK/SERVICES/SUPPLIES**

**3.6.1 Conduct of Services /supplies**

The Services shall be performed by Contractor in accordance with Best international petroleum industry practices. The Contractor shall be responsible for all interface issues, related to providing multiple services under the umbrella of Integrated Services as required as per scope of work / services / supplies.

3.6.2 All correspondence from either party to the other party shall be addressed to its Contract Administrator, unless provided otherwise in the Contract.

**3.6.3 Discipline**

- 3.6.3.1 Contractor shall maintain at all times strict discipline and good order among its employees and subcontractors and shall abide by and conform to all reasonable rules and regulations promulgated by Company governing the scope of work/supplies.
- 3.6.3.2 Contractor shall, and shall ensure that its employees and subcontractors are qualified, experienced & trained and shall, comply with the all Conditions set forth in scope of work /supplies. Contractor agrees to all provisions set forth in this tender and further agrees that failure to comply with the requirements of scope of work/supplies shall constitute grounds for termination of this Contract.
- 3.6.3.3 Company have the right to ask contractor to change / replace its personnel for misbehaving / indiscipline during contract period. Contractor will replace person, within 5 working days without affecting the work progress.

**3.6.4 Legal Requirements**

Contractor shall apply for and obtain all necessary certifications, permits, licenses and authorizations for personnel, equipment and technology required in India, including any authorizations or licenses from any governmental body for use of Contractor's Personnel or technology in the Services or the export of such technology to India.

**Provident Fund Act:**

No dues of Payment of PF Contribution from the Employer & Employees in respect of Contractor working for Onshore Block under Contract along with monthly Returns and remittance particulars of Challans and Statement of workmen.

**ESI Act:**

No dues of Payment of ESI Contribution from the Employer & Employees in respect of Contractor working for Onshore Block under Contract along with their Half-yearly Returns and remittance particulars of Challans and Statement of workmen.

**As per the Labour enactments:**

Regular compliance to Minimum Wage Act, No Dues to the Employees who have resigned or whose services are terminated, engaged by the contractors regarding payment of Wages, service compensation, Bonus, Gratuity, Un-availed Leave salary, Notice pay etc.

**Labour Welfare Cess:**

All prices are inclusive of all taxes including Labor welfare cess. The Goods and Service tax shall be extra at actual. Each bidder has to provide the proof of deposit of Labor welfare cess to SUNPETRO duly signed by CA of the firm.

The Contractor shall indemnify the Company in case of his failure in meeting the statutory requirements as mentioned above. Submission of the above documents shall not relieve the Contractor of any liability to comply with the Applicable Laws.

**3.7 TERMINATION BY COMPANY**

- 3.7.1 Unless otherwise provided, the Contract shall terminate upon expiry of the Term of the Contract. The Contractor shall be paid for the Work successfully completed and certified by Company Representative along with demobilization charges, if any.

**A. Termination for Non- Mobilization or Non-commencement of Work**

If the Contractor fails to timely mobilize the Materials or Equipment required to perform the work or having mobilized, fails to timely commence the work in accordance with the terms of the Contract, it would amount to material breach under the Contract and in such event, the Company shall have right to terminate the Contract immediately upon expiry of such specified time, unless otherwise provided or agreed by the Company.

**Consequences of Termination:**

Upon termination of Contract by Company under this sub-clause, the Contractor shall not be entitled to any payment whatsoever. The Contractor shall immediately refund any sum which the Company might have paid to the Contractor under this Contract. Unless, otherwise provided in

the Contract, the Contractor shall compensate the Company for all losses, expenses etc. which the Company shall sustain on account of such breach by the Contractor.

**B. Termination for events specified below:**

Occurrence of any of events as specified below shall be construed as Event of Default. The Company shall inform the Contractor of the same by issuing a notice of default (hereinafter referred to as "Notice of Default"). If the Contractor, upon receipt of such notice, fails to remedy such default with Seven (7) days, then the Company shall have the right to terminate this contract forthwith. Event of default shall occur if the Contractor:

- a) Makes a general assignment for the benefit of its creditors; or
- b) Refuses or fails to supply enough properly skilled workmen or proper equipment, or materials or services to accomplish the Work in accordance with the original work schedule and the contract; or
- c) Fails to make prompt payment to Sub-contractors or materials, equipment or labour; or
- d) Is in breach of Applicable Law; or
- e) Otherwise breaches the provisions of the contract or part thereof; or
- f) Suspends or abandons activities in the Work site; or Is wound up (not being a member's winding up for the purpose of reconstruction or amalgamation only) or if any deed or action substantially equivalent to any of the foregoing deeds or actions either in Indian law or applicable law shall occur; or
- g) Fails to provide uninterrupted services/perform work.

**Consequences of Termination:**

Upon termination of Contract by Company under this sub-clause B, the Contractor shall be entitled to payment for the work successfully completed and certified by the Company Representative till the date of Termination. Further, the Company shall be entitled to take possession of the Work and finish the Work at the risk and cost of the Contractor by whatever method Company deems just and expedient. Unless otherwise provided in the Contract, the Contractor shall compensate the Company for all losses, expenses etc. and additional expenses which the Company shall sustain, to get the work executed, on account of such breach by the Contractor.

**C. Termination in the event of Force Majeure**

In the event that a condition of Force Majeure exists at the Site for a period of fifteen (15) consecutive days, Company shall have the right to terminate this Contract by giving two (2) days advance notice to Contractor.

**Consequences of Termination:**

Upon termination of Contract by Company under this sub-clause, the Contractor shall be entitled to payment for the work successfully completed and certified by the Company Representative till the date of Termination and demob charges, if applicable as per Contract. No Party shall be obligated to pay the other Party for losses (including consequential losses), expenses, damages etc. sustained on account of event of Force Majeure.

**D. Termination for Convenience**

Company shall have a right to terminate the Contract in whole or in part, at any time with fifteen (15) days prior written notice thereof to the Contractor. Upon any such termination the Contractor irrevocably agrees to waive any and all claims for damages, compensations, including loss of anticipated profits, on account thereof, and as the sole right and remedy of the Contractor, Company shall pay the Contractor in accordance with Price Schedule mentioned in the Contract for the work / services performed by the Contractor till the date of such termination.

**E. Termination for non-performance or non-satisfactory performance**

The Contractor shall perform the work in accordance with GIPIP and the terms and conditions of the Contract. If the Contractor does not perform the Work or any part thereof or its performance is non-satisfactory, then Company shall issue a notice ("**Remedy Notice**") to the Contractor to remedy such non-performance or non-satisfactory performance. Upon receipt of such Remedy

Notice, the Contractor shall remedy such default within Seven (7) days. The Company may ask the Contractor to re-perform any of such services, at sole risk and cost of Contractor. In the event, the Contractor fails to remedy such default within the specified period or the performance of the Contractor is non-satisfactory repeatedly; the Company shall have a right to terminate the Contract immediately without any further notice.

#### **Consequences of Termination:**

Upon termination of Contract by Company under this sub-clause, the Contractor shall be entitled to payment for the work successfully completed and certified by the Company Representative till the date of Termination. Further, the Company shall be entitled to take possession of the Work and finish the Work at the risk and cost of the Contractor by whatever method Company deems just and expedient. Unless otherwise provided in the Contract, the Contractor shall compensate the Company for all losses, expenses etc. the additional expenses which the Company shall sustain on account of such breach by the Contractor.

- 3.7.2 Upon receipt of Notice of Termination, the Contractor shall, unless a notice directs otherwise:
- a) Immediately discontinue the work from that date and to the extent specified in the notice;
  - b) Place no further orders or agreements for materials, equipment, services or facilities except as may be necessary for the completion of such portion of the work which is directed to be continued;
  - c) Do only such work as may be necessary to preserve and protect Work already in progress and protect materials, facilities and equipment on the work site or in transit thereto.

#### **3.7.3 Payment upon Termination**

If the unpaid balance of the Contract Price exceeds the cost incurred by the Company on finishing the work as provided in the Contract, such excess shall be paid to Contractor upon completion of the Work. If the unpaid balance of the Contract Price is lower than the cost incurred by the Company on finishing the work as provided in the Contract, the Contractor shall promptly pay the difference to the Company upon receipt from the Company of the certificate certifying the amount of such difference. Obligations arising under this article shall survive the termination of the contract.

#### **3.7.4 De-hiring:**

- 3.7.5 Company may, at its option, de-hire the services of the Contractor due to interruption in the work / unit programme, by giving three (3) days written notice to the Contractor and during this period no charges for equipment and personnel etc. shall be payable by Company. However, contractor will take immediate action to demobilize the personnel, machines and other equipment immediately. SunPetro may call the Contractor along with the whole setup by issuing fifteen days' notice to mobilize again.

### **3.8 HEALTH, SAFETY & ENVIRONMENT (HSE)**

#### **General**

Contractor shall perform all the work complying to HSE standards as applicable to Oil & Gas fields.

Contractor warrants that it shall perform all such services in a Good and Workmanlike Manner and as per the guidelines issued by, DGMS, DGH and OISD from time to time. Contractor warrants to Company that Contractor's Personnel who are skilled, experienced and competent in their respective positions, and who are fit for duty shall perform all Services. Contractor undertakes to ensure that its personnel comply with Company's regulations regarding health, safety and training which are in force at such time and at such place.

Before the commencement of work, Contractor is required to submit the Safety Management Plan including details of Risk Management related to nature of job. To ensure the safe operations at site, Contractor is required to submit the written safe procedures related to work and comply with DGMS / OMR-2017 and OISD requirements including amendments / modifications issued by DGMS from time to time.

Contractor to provide Health, Safety & Welfare Policy Manual which should be aligned with Company's HSE Policy

### 3.8.1 **Safety**

- 3.8.1.1 In performing the Services hereunder, Contractor and its officers, directors and employees and any subcontractors and their officers, directors and employees shall comply with the provisions of and/or meet the Health, Safety and Environment best Industry standards and requirements set forth in:
- a) the safety management system (hereinafter referred to as “the Safety Management System”) established by Contractor;
  - b) Onshore safety, health, training and protective clothing requirements; and
  - c) All applicable laws, rules and regulations of India.
  - d) Proper safety kits liveries and uniform for all employees / subcontractors working at site.
- 3.8.1.2 Prior to commencement of operations, Contractor shall ensure that all Contractor’s personnel and the personnel of its subcontractors are familiar with the provisions of **Contractor’s Safety Management System**.
- 3.8.1.3 Contractor is responsible for the supervision, monitoring and compliance of and with the requirements and shall take prompt and appropriate action to correct any unsafe work practices by its personnel and those of its subcontractors.
- 3.8.1.4 Company shall, at its complete discretion, monitor and audit Contractor and its subcontractors in respect of compliance with the requirements of this Clause. Contractor shall co-operate fully with, and rectify any deficiencies in compliance pointed out by the Company.
- 3.8.1.5 If during performance of the Services, Company’s Representative is of the opinion that the Contractor is not conducting the Services in compliance with the Safety Case and/or Safety Management System or is conducting the work in such a way as to endanger the safety of Contractor’s Personnel or Company’s personnel, Company Equipment or any of Company’s other contractors’ plant, equipment or materials, then Company’s Representative shall notify Contractor of the breach of safety involved and suspend operations, and the related provisions of the contract shall apply as if the operations had been suspended due to breakdown of equipment.
- 3.8.1.6 Incompetent person shall be at RISK to carry out critical operation. Hence all contractor personnel need to be competent & trained to carry out assigned job. Training need for all contractor’s Employee shall be identified & accordingly shall be trained by the contractor.
- 3.8.1.7 Required PPE to be identified & sufficient stock shall be maintained at all time. Also the Contractor’s Employee shall be trained for uses of PPE.
- 3.8.1.8 Contractor shall provide certificates for but not limited to Lifting Equipment like Crane, Slings, D-Shackles, Chain pulley Blocks. Lifting Equipment shall be color coded & numbered.
- 3.8.1.9 Contractor shall provide Test certificate for Equipment, Materials including Cylinder, High pressure Hoses, & Electrical appliances or as specified in the contract.
- 3.8.1.10 Contractor has to develop ERP jointly with Company & shall ensure awareness Training imparted to all concerned personnel. Mock drill (Table top) for critical scenario need to be conducted before operation. Records to be maintained.
- 3.8.1.11 Contractor shall ensure PTW developed by Company and shall be followed.
- 3.8.1.12 Contractor shall maintain following Records:
1. Employee detail
  2. Pre medical check-up record
  3. Competency Record
  4. Training & awareness Record
  5. PPE record
  6. Accident / Incident Record
  7. Mock drill Record

8. Audit Observation & compliance record.
9. Accident / Near miss Report.

3.8.1.13 In case an item or activity is not covered by any HSE standard, or if the standard is considered to be inadequate, Contractor shall immediately notify the Company of such absence or inadequacy of defined standards. Company & Contractor shall then jointly develop & agree on additional standards to cover the item or activity and reduce the associated risk to as low as reasonably practical (ALARP) before the item or the activity is included or continued in the performance of the Work.

### 3.8.2 Environment

3.8.2.1 Contractor hereby acknowledges Company's commitment to conduct its operations in a manner that not only complies with all relevant environmental protection and pollution control legislation of India but also that, such operations do not cause environmental damage or pollution. In recognition of the aforementioned commitment, Contractor shall perform the Services in an environmentally acceptable and safe manner consistent with GIIP and shall ensure that its performance of the Services is properly monitored

3.8.2.2 Contractor shall prepare Aspect & Impact document related to their Job scope and shall submit to Company.

3.8.2.3 Valid Pollution under control Certificate for Engine above 150 KVA

3.8.2.4 Contractor shall have Waste Management Plan for their scope of work.

3.8.2.5 Hazardous Waste shall be sorted out & disposed as per the Pollution Control Board norm as applicable.

3.8.2.6 Contractor shall display MSDS for Chemicals, Reaction Matrix for Chemicals and High noise area.

3.8.2.7 Eye wash station shall be provided at suitable place.

3.8.2.8 Working area is to be illuminated as per Lux standard.

In particular, the Contractor shall:-

- a) employ generally accepted industry standards, including, as required, advanced techniques, practices and methods of operation then available for prevention of environmental damage;
- b) take necessary and adequate steps to prevent environmental damage and, where some adverse impact on the environment is unavoidable, to minimise such damage and the consequential effects thereof on people and property; and
- c) adhere to the guidelines, limitations or restrictions, if any, imposed by the Environmental Clearance referred to in this clause as applicable on the date of this Contract and as such Environmental Clearance may be revised, expanded or replaced.

3.8.2.9 Without limiting the generality of the provisions of this Clause hereof, Contractor shall comply with, and ensure that its employees, agents and subcontractors comply with, all applicable environmental protection and pollution control laws, regulations, rules and ordinances of all relevant state, central and local Government of India.

3.8.2.10 If during Contractor's performance of the Services, Company is of the opinion that Contractor is either not conducting the Services in compliance with any one or more of the provisions of Clause, all applicable environmental protection laws, rules and regulations imposed by state, central or local governments and all environmental guidelines and procedures furnished by Company to Contractor from time to time, or is conducting the Services in such a way as to endanger the environment or as to risk being in breach of any laws, rules or regulations of any such bodies, then Company shall notify Contractor of the breach involved and suspend all operations whereupon the provisions of clauses mentioned herewith in the contract apply as if the Well Operations had been suspended due to equipment breakdown.



- 3.8.3** Contractor has to submit Monthly Compliance Reports to the company on all aspects as listed above or as decided by the company.

### **3.9 SETTLEMENT OF DISPUTE/ ARBITRATION**

- 3.9.1** The Company and the contractor undertake that all disputes, differences or questions at any time between the parties as to the construction to this Contract or as to any matter or thing arising out of it or in any way connected therewith ("Disputes") shall be resolved between the parties in good faith by having the discussion between the Project Manager / Contract Manager level and if required may be taken up to the Company -Head level to resolve the issues / disputes in the interest of the work and at least three attempts shall be made by the both the parties in this direction.

- 3.9.2** In the event the disputes arising out of / connected with this Contract, which cannot be amicably resolved by Arbitration. The arbitration shall be conducted in accordance with the provisions of the Arbitration and Conciliation Act, 1996, (including any statutory modifications or re-enactments thereof) and rules there under excluding any laws, opinions, or regulations that would require application of the laws of any other jurisdiction). The Arbitral Tribunal shall consist of three arbitrators. The Party raising the Dispute shall give a Notice to that effect to the other party and shall nominate the first Arbitrator in such Notice. The other Party shall respond to such Notice within 30 days of receipt thereof and nominate the Second Arbitrator. The two arbitrators so nominated shall appoint the third arbitrator within 30 days of appointment of the Second arbitrator. The Third Arbitrator so appointed shall be the Presiding Arbitrator. The arbitrators to be appointed shall be retired Judges of any of the High Courts or Supreme Court of India. Unless otherwise agreed in writing, the arbitration shall be held at Mumbai, India.

- 3.9.3** It is also a term of the Contract that the Contractor shall not stop the Work under this Contract and the Work shall continue as expected regardless of whether the arbitration proceeding have commenced or not. Notwithstanding any disagreement, dispute, protest, request for or pendency of arbitration or court proceedings relating directly or indirectly to the Work, at all times, Contractor shall proceed with the Work in accordance with the determinations, instructions and clarifications of Company in accordance with the terms and conditions of this Contract. If the Contractor fails to proceed with the Work, he shall be considered to be in default and shall be held liable for direct, indirect and consequential costs and expenses arising from such default. During the period Contractor is proceeding with the Work, he shall be paid the undisputed portion of his claims which are due under the Contract.

- 3.9.4** The right to arbitrate disputes and claims under this Contract shall survive the termination or invalidity of this Contract or any term hereof.

- 3.9.5** Any award rendered by the arbitrators shall be final and binding upon the parties. Any judgment upon such award may be entered in any court having jurisdiction or application may be made to such court for a judicial confirmation of such award and judgment or order of enforcement, as the case may be.

### **3.10 ENTIRE AGREEMENT/ WAIVERS**

- 3.10.1** This Contract sets forth the entire CONTRACT between Company and Contractor which shall supersede all previous communication/ agreements either oral or written. No terms, conditions, understandings or agreements purporting to modify or vary the terms of the Contract (whether written or oral) of the parties made prior to the date of this Contract shall apply except where Company and Contractor have expressly varied the same in writing under the terms of this Contract.

- 3.10.2** None of the provisions of this Contract shall be considered waived by Company unless Company gives such waiver in writing. No such waiver shall be of any past or future default, breach or modification of any terms, provisions or conditions of this Contract unless expressly set forth in such waiver.

- 3.10.3 None of the following shall release Contractor from any of the warranties or obligations of this Contract or be deemed a waiver of any right or remedies as to any prior or subsequent default in accordance with the Contract:
- i) Failure by Company to insist upon strict performance of any terms or conditions of this Contract,
  - ii) Failure or delay to exercise any rights or remedies provided herein or by law,
  - iii) Failure to properly notify Contractor in the event of breach, except for any breach which according to provisions of Contract has to be notified,
  - iv) Acceptance of or payment for any Service or review of any design, or
  - v) Warranty on the Equipment if sold to Company by the Contractor will continue upto the expiry of the warranty period even if the Contract is expired or terminated.

### 3.11 **LIQUIDATED DAMAGES**

#### 3.11.1 **Liquidated damage**

If Contractor for any reason other than Force Majeure, fails to timely mobilize all the material, equipment (fit for purpose) and/or personnel with requisite experience at designated location/well site as per the time schedule mentioned in the Contract or the extended date or fails to timely commence, continue or perform the services or continue uninterrupted Work in accordance with the terms of this Contract or the extended date or if Contractor repudiates the Contract before completion of the Works in accordance with the Contract, or any if above reason resulting to delayed delivery of work completion, the Company may without prejudice to any other right or remedy available to the Company, shall have a right to seek payment from the Contractor as ascertained and agreed liquidated damages, and not by way of penalty, One percent (1%) for each week of late completion of work / delayed delivery of work up to a maximum of Ten percent (10%) of total estimated / annualized contract value.

The payment of liquidated damages pursuant to this section shall not affect the rights of Company as per Contract or Applicable laws including the following rights:

- a. Terminate the Contractor or a portion or part of the Work thereof at any time during the term of the Contract and / or,
- b. Recover damages resulting from Contractor's breach of any of the provisions hereof from any kind of dues and / or,
- c. Get the Work done by any other contractor at the risk and cost of the Contractor and/or,
- d. Invoke bank guarantee or any other security provided by the Contractor and/or,

By way of abundant caution, it is clarified that in addition to recovering liquidated damages, Company may exercise any one or more of its rights mentioned above as per the Contract and the Applicable Law.

#### 3.11.2 **Deleted.**

3.11.3 The Parties agree that the liquidated damages indicated hereinabove are genuine pre-estimate of the minimum loss/ damage which COMPANY can suffer on account of delay / breach on the part of the Contractor and the said amount shall be payable without any requirement of proof of the actual loss or damage caused by such delay / breach.

3.11.4 Where Company is required to wait for any reason for a Contractor Equipment and/or personnel which is not made available on the site as per the schedule, in addition to liquidated damages payable by the Contractor, the Contractor shall also pay as pre-agreed damages an amount equivalent to daily **operating rate** for hired equipment, till time such equipment is made available to Company.

3.11.5 By way of abundant caution it is clarified that during this period of delay, Contractor will not be eligible for any payment, whatsoever.

### 3.12 **NOTICES**



All notices and other communications provided for in this Contract shall be in writing and shall be delivered at the addresses for notices given in the Contract. A party may notify the other from time to time of changes in the address for notices. E -mails and facsimile transmissions shall be held to have been received at the time of transmission report.

**3.13 APPLICABLE LAW**

All questions, disputes or differences arising under, out of or in connection with this Contract and the relationship of the parties hereunder shall be governed by and interpreted in accordance with the laws of India (both procedural and substantive) and parties hereby agree to submit to the jurisdiction of the Courts in Mumbai / Mumbai, India.

**3.14 ACTS AND REGULATIONS, GUIDELINES**

THE MINES ACT, 1952 along with the OIL MINES REGULATIONS, 1984 and all their amendments issued including requirements of Good International Petroleum Industry Practice (GIPIP) for all services are to be followed till validity of contract.

**3.15 CONFIDENTIALITY**

**3.15.1** "Confidential Information" shall be deemed to include all information including but not limited to any technical, commercial and financial information, improvement, inventions, know how, innovation, technology, trade secrets, professional secrets, copyrights and any other intellectual property, discoveries, ideas, concepts, papers, software in various stages of development, techniques, models, data, source code, object code, documentation, manuals, flow charts, research, process, procedures, functions, customer names and other information related to customers, price lists and pricing policies. However, the Parties hereto acknowledge that Confidential Information shall not include any information that:-

- a) is now or subsequently becomes publicly known or available without breach of this Contract;
- b) was previously in the possession of the Receiving Party without any obligation of confidentiality and which was not acquired from, provided, given, sold or otherwise disclosed (directly or indirectly) by the Disclosing Party not through this Contract.
- c) is required to be disclosed under any Applicable Law (subject however to the party who is required to disclose the information as such is providing reasonable notice of the same to the other party, prior to making any such disclosure).

**3.15.2** The Contractor shall hold the information confidential and shall not divulge or disclose the information, or make the information available to any person or entity, other than its representatives and ensure that only such authorized Representatives who are expressly authorized by it to and whose duties require them to possess the Confidential Information shall have access to the Confidential Information on a need-to-know basis. In case of any breach of these terms or any act or omission by any of its authorized Representatives, then damages alone may not be an adequate remedy and that the remedies of injunction and specific performance or any other equitable relief may be imposed.

**3.16 ASSIGNMENT AND SUBCONTRACTING**

**3.16.1** Company shall be entitled to freely assign its rights, obligations and duties under this Contract to its Affiliate or other Participant or JV, for any Blocks by giving written notice. Company shall be entitled to assign by novation its rights and obligations under this Contract to any third party with prior written consent of the Contractor, which shall not be unreasonably withheld.

**3.16.2** Contractor shall not sublet or subcontract in part or in whole the Services to any third party without prior written consent of Company. If the Contractor sub contracts part of the Contract to a sub-contractor, Contractor shall ensure that sub order's reflect the requirements under this Contract and the Contractor shall furnish to the Company within one month from the dated of signing of the Agreement, a signed copy of the complete Agreement. Further in case of any change in the Contract with the Sub Contractors, the same shall be notified to the Company within a period of one (1) month.

**3.16.3** However, no such approval for sub-contracting shall relieve Contractor from any obligation or liability under the Contract and Contractor shall be fully responsible for acts and omissions of any sub-contractor or supplier and its employees and agents as though they were the acts

and omissions of Contractor or its employees or agents. Also in no case sub-Contractors shall pass on any claim/ liability to Company.

**3.17 INVOICING AND PAYMENT**

3.17.1 Invoices shall be itemized with a full break down of the Service performed /supplies made and shall be complete with all back-up details, documentation, information, receipts, packing list, ocean bills of lading, certificate of origin, etc. and shall set forth the facts relating to all activities and transactions handled for Company's account and shall be verified and signed by an authorized signatory designated by the Contractor to show the basis for Contractor's application of the Contract payments and the resultant value of the invoice.

3.17.2 Contractor shall invoice to Company for payments hereunder on Completion of Services. Unless and otherwise mentioned anywhere else in this Contract, Company shall make payment, of the correct/ undisputed / Certified invoice supported with job sheet / field ticket / any other relevant document, which is jointly signed by Engineer In-charge / Company representative along with the Contractor representative, within Thirty (30) working days period after receipt of invoice unless the Company disputes the invoice or a part thereof. Prices negotiated and finalized shall be firm and binding for the agreed Contract period as per Clause 3.2. (General Instructions) i.e. three (3) years and one (1) year extension period. No interest shall be payable on delayed payments by the Company. Exchange Rate used for payment will be the average of SBI Selling and Buying rate prevailing one day prior to the date of release of payment.

The invoice should be submitted to Company only after having submitted the following documents at Mumbai, if applicable. The Contractor shall indemnify the Company at all times for the damages caused or losses incurred by the company due to non-compliance with the existing laws and regulations by the Contractor.

3.17.3 The settlement of any invoices shall not be deemed acceptance of the Services or any part thereof and shall not prejudice the right of Company to question the propriety of any such charge at any time thereafter. A written response to Company's claim for omission corrections or errors in charges and credits for Company's account shall be made by Contractor as soon as practicable and in no event later than sixty (60) days from the date of such claims.

3.17.4 Contractor shall support all invoices with any data and/or information reasonably requested by Company. Contractor agrees to retain all applicable documentation and records for a period of not less than Four (4) years from the end of the calendar year in which this Contract terminates. Company or any party nominated by Company shall be entitled to audit and examine all documents and/or records necessary to verify the correctness of charges contained in any invoice. The payment of an invoice shall not preclude Company's right to audit any charge during said three-year period. Any discrepancies found in such audit shall be paid or reimbursed forthwith. Company shall have the right to reproduce any such documents which have been inspected.

Invoices shall be endorsed with the Contract number and title and shall be submitted in tri-plicate with one original and two Copies (clearly marked "Original" or "Copy") once in each month and shall be forward

**Head –Commercial & Supply Chain Management.**  
**Sun Petrochemicals Private Limited (SunPetro)**  
**17/B, Mahal Industrial Estate, Mahakali Caves Road,**  
**Andheri (E), Mumbai – 400093, Maharashtra, [India]**

3.17.5 All payments to the Contractor under this Contract shall be made in the currency quoted by them or Indian Rupees to the Indian Bidders or United States Dollars to the Foreign Bidders. The currency of price schedule shall not be allowed to be changed during the term of the Contract.

3.17.6 The Contractor shall not claim any charges under any head during the period the equipment or tools are damaged, damaged beyond repair, un-operational, or declared dangerous for

operation and cannot be operated / used for the said services. No payment shall be made for either the Standby rate, Stack Rate or under any other head till the tools / equipment are redressed, replaced or declared safe for operation & fit for purpose. No payment for either standby rate or operational rate shall be made for the personnel associated with the operation of the said tools/equipment.

### 3.17.7 **Audit**

The Company and its authorized representatives shall have access to, and the right to audit and obtain copies of any of Contractor's and its subcontractors' or agents' documents of whatsoever nature (except the confidential information of pricing formulate of the Contractor) relating to or in connection with the performance of the Work, including books, vouchers, receipts, invoices, correspondence, government correspondence, contracts, representations before statutory authorities, tribunals, courts and any other records. The Contractor will preserve and will cause its subcontractors and agents to preserve all such records for a period of four (4) years from the end of the calendar year in which this Contract terminates and will, upon written request, make them available to Company and its representatives. The Contractor shall provide photocopies of any documents within a reasonable period whenever demanded by the Company, Audits referred in this Clause will be made during Contractor's normal working hours. Any payment made by the Company shall not imply acceptance of liability on the part of the Company. Company shall have the right to notify Contractor of any matters arising in an audit which may necessitate making an adjustment; and such adjustment, whether by reimbursement to Company or otherwise, shall then promptly be made. Company shall also have the right to obtain assistance and statements from any of Contractor's Personnel to the extent it deems necessary, and Contractor and its subcontractors shall make such personnel available at their assigned locations if still under employment with Contractor or its subcontractors.

## 3.18 **TAXES AND DUTIES**

### 3.18.1 **Taxes:**

All rates and the Contract Price shall be inclusive of all concessional Taxes & duties and such other payments as may be payable under any Applicable Laws (except GST). Except as stated, Contractor shall bear all income, corporate, property, GST, work contract taxes and all other taxes, duties, levies, surcharges, imports and similar taxes and duties duly levied or imposed on Contractor on account of the payments received by Contractor from Company for the Services as may be payable under the Applicable Laws and any amendments thereto. GST if applicable shall be charged over and above the quoted prices and shall be paid by Company along with the invoice on submission of proof.

Company shall withhold from the payments to Contractor such amounts as determined by the prevailing taxation laws in respect of Contractor's Services. Company shall deposit these tax withholdings at source with the Indian revenue authorities and provide Contractor all appropriate tax receipts and forms evidencing the deposit of these tax withholdings. Contractor shall be responsible for filing returns of income to Indian revenue authorities for payments made by the Company pursuant to this Contract in accordance with the prevailing taxation laws.

### 3.18.2 **Personnel Taxes**

All employment taxes and contributions imposed by any law, regulations or by trade unions with respect to or measured by the compensation, wages, salaries or other compensation paid to employees of the Contractor, including without limitation, taxes and contribution or unemployment compensation insurance, medical and health insurance, welfare funds, pensions and annuities and disability insurance shall be paid by Contractor. In the event that Contractor fails to do so and Company is liable to any interest or any penalty arising out of such personnel taxes, Company shall have the right to recover all such amounts from Contractor.

### 3.18.3 **Custom Duty, Entry taxes, etc.**

Equipment, materials and supplies imported for use solely and exclusively on matters (inter alia) related to petroleum operations. Company and Contractor agree to cooperate and to use all reasonable endeavors to obtain any exemption to which Company and/or Contractor is entitled in accordance with such notifications. Contractor expressly agrees to furnish

necessary documentation, bonds or undertakings to Government authorities and / or to Company, which may be required for availing such concessional exemption. It is expressly understood that Contractor shall be required to re-export any of its Equipment (unless consumed during performance of Services) and left-over chemicals / additives imported under this Contract to enable Company to avail exemption of custom duties. Contractor undertakes to re-export Equipment at the earliest but not later than within fifteen (15) days of completion or termination of Services and shall be solely responsible for all customs formalities for importation and exportation of Contractors Equipment and materials at the port of entry or the port of exportation as the case may be.

- 3.18.4 Contractor shall protect, indemnify and hold harmless Company, its Co-ventures, their directors, officers, and employees from any and all claims or liability for incorrect or under valuation of tax payable on income excess profits, customs duties, royalty or other taxes assessed or levied by any government agency including any tax assessed or levied on account of property or equipment of contractor, wages salaries or other benefits paid to Contractors employees or employees of sub-contractors, on Company its Co-ventures, their directors, officers and employees' including from any and all claims or on account of any payment made to or earned by contractor.

3.18.5 **Change in Law**

- 3.18.5.1 In the event of any change or amendment of any Act or law, Rules or Regulations of Government of India or Public Body, which becomes effective after the effective date of this Contract and which results in increased / decrease cost of the works under the Contract though increased / decreased liability of taxes, (other than personnel and Corporate taxes), duties, the Contractor shall be indemnified for any such increased cost by the Company subject to the production of documentation proof provided the rates and all applicable taxes along with the tax rate, were clearly indicated at the time of Bid submission by contractor.

- 3.18.5.2 Company shall not bear any liability in respect of (i) Personnel taxes on the employees of Contractor and the employees of all its sub-Contractors etc. (ii) Corporate taxes in respect of the Contractor and its sub-Contractors." (iii) Any taxes for which the Contractor or any or all of his sub-contractors are directly assessable i.e. Corporate taxes and Fringe benefit tax in respect of Contractors and all of their sub-contractors, agents etc.

3.19 **INSURANCE**

- 3.19.1 For its risks and liabilities assumed hereunder, the Contractor shall, at its own expense procure and maintain as a minimum, the insurances set out in this Clause and ensure that they are in full force and effect throughout the life of the Contract. All such insurances (including insurances provided by Sub-Contractors) other than Employers Liability Insurance / Workmen's Compensation to the extent of the liabilities assumed by the Contractor under the Contract,

- 3.19.2 The provisions of this Clause shall in no way limit the liability of the Contractor under the Contract. All such insurances shall be placed with reputable and substantial insurers acceptable to the Company.

Contractors Insurances shall be primary to, and receive no contribution from Company insurances. If the Contractors neglects, fails, or refuses to obtain or maintain insurances required to be effected, or fails to provide certification etc., the COMPANY has the right to procure and maintain policies at Contractors risks and 5% more expense.

- 3.19.3 The Contractor shall be responsible for and shall save, indemnify, defend and hold harmless SunPetro , Joint Venture partners of SunPetro, the Government of India, their respective officers, directors employees, agents and other persons with whom Company may be associated (the COMPANY) from and against all claims, losses, damages, costs (including legal costs) expenses and liabilities in respect of:
- a. loss of or damage to property of the Contractor whether owned, hired, leased or otherwise provided by the Contractor arising from or relating to the performance of the Contract,
  - b. personal injury including death or disease to any person employed by the Contractor arising from or relating to the performance of the Contract.

- 3.19.4 Prior to commencement of services / delivery / work hereunder or within 7 days of signing of Contract, whichever is later, Contractor shall deliver to Company the following certificate(s)
- evidencing the issuance of insurance containing the coverage required herein and
  - providing that insurance shall not be cancelled or materially change without thirty (30) days prior written notice to the Company. Commencement or performance of services/work without delivering the certificates of insurance shall not constitute a waiver of contractor's obligation to provide the required coverage.

3.19.5 The insurance shall cover for the following:

- All consequences of occupational accidents or illness Employer's Liability Insurance, in such amounts as may be required by the laws of India or any other country or political subdivision thereof applicable to any employee engaged in performance of the work; as per regulations, extended to cover benefits provided under maritime law, if applicable. Contractor has the obligation to comply with Indian Social Security laws and regulations.
- Commercial or comprehensive General Liability Insurance, including coverage for contractual Liability to cover liability under this contract and cross liability Sudden and Accidental pollution, in the amount equal to the contract value combined single limit each occurrence with an aggregate limit of contract value for bodily injury and property damage provided that there will not be any excess/deductibles in the policy to be taken by the contractor. The coverage should provide insurance for any incident or series of incidents covering the operations of the Contractor in the performance of the Contract. If Contractor's Liability Insurance is written on a "claims made" form it must provide for (i) a retroactive date prior to, or coincident with, the commencement of service under this contract and (ii) a minimum extended claims reporting period of one (1) year. This policy shall include Company and its directors, officers, employees and agents as additional insured.
- Comprehensive Automobile Liability Insurance, covering owned, non-owned and hired motor vehicles, with a limit of liability as per regulations/ laws including passenger liability.
- Personal Accident and Medical Insurance for each of Contractor's Personnel valid for the area(s) in which Work is to be performed and for any travel for any period(s) during which Work is being performed. This insurance should include cover for all hospital and medical costs, and all costs for repatriation.
- Contractor shall carry or cause to be carried insurance covering all Contractor's Equipment against loss or damage at all times including during transportation to/from the site and at the site. However, Contractor reserves the right to self insure its own assets.
- The Contractor will be required to have insurance coverage for "Oil Industries Endorsement" in its insurance policy.

#### **General Conditions for Insurance**

- Contractor hereby waives its right of subrogation against the additional insured and shall cause its insurers to waive their rights of subrogation against the additional insured.
- No form of contractor liability self-insurance, including but not limited to insuring with a parent, subsidiary, or affiliate organisation, is acceptable or allowable under the terms of this contract, unless agreed to by Company prior to commencement of services hereunder.
- Contractor assumes full responsibility for the insurance or self-insurance over his personnel, assets, machinery and equipment, including third party to be used in the performance of this contract. Therefore, except as otherwise provided herein, any damage or injury suffered due to a total or partial loss to such assets, machinery and equipment will be at Contractor's expense. Contractor must insure for full replacement value of any and all equipment used in performing the Work.
- All exclusions and indemnities given under this Contract shall apply irrespective of cause and notwithstanding the negligence, breach of duty (whether statutory or otherwise) or other failure of



any nature of the indemnified party or any other entity or party and shall apply irrespective of any claim in tort, under contract or otherwise at law.

- 3.20 **CONTRACTOR'S OBLIGATIONS AND WARRANTIES**
- 3.20.1 The general allocation of responsibilities between Company and Contractor are set out in responsibility matrix and other clauses mentioned in this documents and the Exhibits.
- 3.20.2 Contractor represents that it is engaged in such specialized operations and represents that it has adequate resources and personnel in accordance with Good international Petroleum Industry Practices and shall perform the Work strictly in accordance with this Contract and shall comply with and adhere strictly to Company's instructions and directives on any matter concerning the Work. Contractor warrants that it is aware of all the Well Locations environment, zoning and other regulations legal description prescribed in this Contract.
- 3.20.3 At all times Contractor shall respond promptly and shall accurately furnish to Company information about the Work as requested.
- 3.20.4 Contractor shall take full responsibility for the protection and security of materials and equipment while such materials and equipment are temporarily stored in Contractor's facility awaiting for transportation or otherwise in Contractors custody.
- 3.20.5 Contractor shall advise Company immediately in writing of any labour dispute or anticipated labour dispute, which may be expected to affect the performance of the Work.
- 3.20.6 Contractor shall use all reasonable care to ensure that the equipment is delivered and maintained in a fit condition for the intended Work and shall at its cost and expense man operate replace supply, repair and maintain the equipment.
- 3.20.7 **Contractor Personnel**  
Contractor shall use all reasonable care to provide, at Contractors sole risk and cost, competent, skilled personnel to perform Work and shall take responsibility for their actions. Contractor shall ensure that the necessary personnel are available at the Work Site / Location when required by SunPetro for commencement of the Work and shall continuously be available during the duration of the Contract. Contractor shall be solely responsible throughout the period of this Contract for providing all the requirements of its personnel, including but not limited to, accommodation, transportation, meals, medical attention, vacations and time-off allowance, travel and any other benefits due to such employees under any law or otherwise. SunPetro shall have no responsibilities or liability whatsoever in this regard.
- 3.20.8 SUNPETRO shall be entitled, without prejudice to any other rights or remedies available to SunPetro under this Contract or otherwise in law to object to and require Contractor to remove from the Work any person who in the reasonable opinion of SunPetro is incompetent, misconduct's himself, is negligent in the proper performance of his duties or is otherwise considered to be undesirable. In such an event, Contractor shall forthwith remove such person from the Work, and such person shall not be again employed upon the Work without the written permission of Company. Contractor shall forthwith replace within 5 working days, at Contractor's sole expense, any such discharged person with a suitable qualified and experienced person satisfactory to Company without affecting the work.
- 3.20.9 **Permits and Instructions**  
Contractor shall obtain all requisite permits and approvals under Applicable Law for the performance of the Scope of Work / supplies. In the event of Contractor receiving instructions from Company to stop Work/supplies operations, Contractor shall comply with the same with immediate effect.
- 3.21 **FORCE MAJEURE**
- 3.21.1 "Force Majeure" shall mean any act which is insurmountable and outside the reasonable control of the parties Events of Force Majeure shall include, but shall not be limited to, acts of God, lightning, earthquake, flood, fire, explosion, major storm (hurricane, typhoon, cyclone, etc.) or tidal wave, act of war (declared or undeclared) or public enemy, riots (otherwise than amongst Contractor's personnel), strike (excluding strikes, lockouts or other industrial disputes

or action solely among employees of Contractor or its subcontractors), act or omission of sovereign states or those purporting to represent sovereign states, blockade, embargo, quarantine, public disorder, sabotage or any other events beyond the control of the parties or either of them., Strikes shall only be considered as Force Majeure if they are officially declared/ accepted strikes. However, Force Majeure shall not include occurrences as follows:

- 3.21.1.1 Late delivery of materials caused by congestion at supplier's plant or elsewhere, an oversold condition of the market, inefficiencies, or similar occurrences
- 3.21.1.2 Late performance by Contractor and/or a sub-contractor caused by unavailability of equipment, supervisors or labor, inefficiencies or similar occurrences;
- 3.21.1.3 Mechanical breakdown of any item of Contractor's or its Sub-contractor's equipment, plant or machinery; or
- 3.21.1.4 Delays due to ordinary storm, inclement weather, seasonal rains or monsoon; or
- 3.21.1.5 Non-conformance by Sub-contractors;
- 3.21.1.6 Financial distress of Contractor or any Sub-contractor
- 3.21.1.7 Failure to carry out operations in accordance with the instructions of the Company on account of any accident, breakdown or non-performance or unsatisfactory performance of the Rig or any rig equipment(s) or on account of any reason within the control of the Contractor.

Neither Party hereto shall be liable to the other, for the payment of money, for failure to perform any obligations hereunder when performance is hindered or prevented by Force Majeure. The affected party shall inform the other party immediately in writing (within 24 hours) of its inability to meet its obligations hereunder, specifying the cause of Force Majeure, and shall do all that is reasonably within its power to remove the Force Majeure conditions. Such party shall advise the other party when such Force Majeure ceases (within 24 hours of ceasing of Force Majeure) and shall resume performance of its obligations hereunder as soon as reasonably possible thereafter. No payment will be due to the Contractor between the commencement of Force Majeure and commencement of Normal operations by the affected party.

- 3.21.2 The affected party shall make every reasonable effort to. Should any act or acts of Force Majeure cause the suspension or artificial suspension of operations there under for all or part of the Work for a continuous period of more than seven (7) days, the parties shall meet and determine the appropriate measures to be taken. In the event that a condition of Force Majeure exists at the Site for a period of at least fifteen (15) consecutive days, Company shall have the right to terminate this Contract by giving two (2) days advance notice to Contractor.

### 3.22 **WARRANTIES AND REMEDIES**

- 3.22.1 Contractor represents that it is engaged in such specialized operations and represents that it has adequate resources, service capability and personnel in accordance with GIPI and shall perform the Work strictly in accordance with this Contract and shall comply with and adhere strictly to Company's instructions and directives on any matter concerning the Work. Contractor agrees to comply with, and shall ensure that its Personnel comply with, all Applicable laws, International /Indian codes, rules, regulations and specifications applicable to the Equipment and Services. Contractor warrants that all items rented to Company under this Contract shall meet specifications as set forth in the contract and shall be in good working condition throughout the Contract period (ordinary wear and tear excepted). All Equipment, materials, machinery and goods procured and supplied by Contractor under this contract, including, without limitation, service related materials (collectively items) shall be of good quality and workmanship, safe and free from defects in workmanship. Time is of the essence of the Contract and Contractor shall perform all Services in conformity with the time schedule, specifications and the obligations contained herein, unless the delay is due to Force Majeure or reasons wholly within Company's control. Any failure by Contractor to timely deliver the goods / materials work at the point of delivery and / or perform the services in timely manner shall attract the provisions of Clause indicated in Liquidated Damages.

- 3.22.2 The Service warranty applies to all services performed by Contractor as part of the Work. Contractor warrants that it shall perform all such services in a Good and Workman like Manner. Contractor may be required at Company's sole option (unless stated otherwise elsewhere in the Contract) to supervise the installation, running in or pulling out of the Equipment to enable it to be fully operational within the time specified in the Contract. Contractor warrants to Company that Contractor's Personnel who are skilled, experienced and competent in their respective positions, and who are fit for duty shall perform all Services. Contractor undertakes to ensure that its personnel comply with Company's regulations regarding health, safety and training which are in force at such time and at such place.
- 3.22.3 In the performance of the Services, if the Contractor fails to comply with the warranties and undertakings set forth, the Contractor shall as directed by the Company prior to demobilization, at Contractor's cost and without prejudice to any other right or remedy of Company under this Contract, re-perform the Services or correct such failure or furnish an alternative acceptable to Company in order to comply fully with the requirements of the Contract. Defects shall not be deemed waived by Company's failure to notify Contractor upon receipt of Services or by payment of invoice.
- 3.22.4 Contractor shall use all reasonable care to provide, at Contractors sole risk and cost, competent, experienced, skilled personnel to perform Work and shall take responsibility for their actions. Contractor shall ensure that the necessary personnel are available at the Work Site / Location when required by Company for commencement of the Work and shall continuously be available during the term of the Contract. Contractor shall be solely responsible throughout the period of this Contract for providing all the requirements of its personnel, including but not limited to, accommodation, transportation, meals, medical attention, necessary permits / licenses as per rules / laws, vacations and time-off allowance, travel and any other benefits due to such employees under any law or otherwise. Company shall have no responsibilities or liability whatsoever in this regard. Company shall provide boarding and lodging to the Contractor's personnel while at the work.
- 3.22.5 Day-rates or compensation of whatsoever nature shall not apply to time when the Contractor's Equipment/tool is unable to perform to the satisfaction of the Company in accordance with the Contract for any reason.
- 3.22.6 If Contractor shall fail in its obligations under this Contract and does not remedy such default after having received prior written notice thereof, Company may on its own initiative arrange for alternative means of performance of Services. Any direct and reasonable costs or expenses incurred by Company thereby, shall, together with an additional five per cent (5%) of such costs and expenses, be payable by Contractor and may be deducted and set off against any monies owed to Contractor by Company pursuant to the Contract. Should any time be lost during any such alternative arrangements in the performance of the Services, the Equipment and Personnel shall be at zero Rates for the lost time for that particular tool/ service in default and no Rates of whatsoever nature shall be payable for the duration of such default. The above shall be without prejudice to any other rights available to the Company under the Contract or as per Applicable Laws
- 3.22.7 Contractor shall take all measures necessary and / or proper to protect personnel, Work Site and facilities as well as observe all safety rules and regulations of Company, given to Contractor in writing provided such rules do not conflict with those of any Governmental Agency having jurisdiction over operations conducted hereunder. No smoking or open flames shall be permitted on the drilling unit and nearby except in areas marked by Contractor and approved in writing by Company. Contractor shall use all reasonable means to prevent and control fires and blowouts, as well as protect the hole, the reservoir or any other underground formation from loss or damage.
- 3.22.8 Contractor shall have no authority to make any statements, representations or commitments of any kind or to take any action which shall be binding upon Company, except as provided for herein or otherwise authorized in writing by Company.



3.22.9 Contractor shall notify Company promptly, but no later than twenty four (24) hours, upon discovery of any instance where Contractor has not complied with the requirements of this Clause.

3.22.10 The Company reserves the right to purchase / replace specific tools / equipment at any time during the Contract and include them in the Contract.

### 3.23 **LIENS**

Contractor shall immediately pay and discharge any lien, claim or encumbrance, of any nature, (or shall provide security for payment thereof) attributable to Contractor. Contractor shall indemnify and hold Company harmless from and shall keep Company's equipment and property free and clear of all liens, claims, assessments, fines and levies incurred, created, caused or committed by Contractor. If Contractor fails to pay and discharge any such lien, claim or encumbrance, then Company may do so and charge Contractor for all costs, with an additional five per cent (5%) of such costs and expenses, be payable by Contractor and may be deducted and set off against any monies owed to Contractor by Company pursuant to the Contract. Company shall have the right to retain out of any payment to be made to, or to be reimbursed to, Contractor, an amount sufficient to indemnify it completely against any such lien, claim, assessment, fine or levy exercised or made and all associated costs.

### 3.24 **INDEMNITY AND LIABILITIES**

#### 3.24.1 Indemnity by Contractor:

Contractor shall be responsible at all times, including time in storage, in transit, on the rig or at Company's well location and shall indemnify and keep the Company Group indemnified and harmless from all actions, proceedings, suits, claims, demands, liabilities, damages, losses, costs, charges, expenses or other obligations hereunder directly or indirectly associated herewith, judgments and fines arising out of or in the course of execution of work under the Contract or performance of obligations by the Contractor thereunder including but not limited to:

a) personal injury, illness or death of:

i) any of Contractor's Group's personnel (except if directly caused by the Gross Negligence or Willful Misconduct of Company Group).

b) loss or damage to:

i) any property owned, hired or supplied by Contractor Group (except if directly caused by the Gross Negligence or Willful Misconduct of Company Group).

#### 3.24.2 **Indemnity by Company:**

Company shall indemnify and keep the Contractor Group indemnified and harmless from all actions, proceedings, suits, claims, demands, liabilities, damages, losses, costs, charges, expenses and fines arising from:

- i) personal injury, illness or death of any Company Group's personnel (except if directly caused by the Gross Negligence or Willful Misconduct of Contractor Group);
- ii) Any loss or damage to any property owned, hired or supplied by Company Group (except if directly caused by the Gross Negligence or Willful Misconduct of Contractor Group).

#### 3.24.3 Third Parties:

A. Contractor shall defend, indemnify and hold Company Group harmless from and against any and all claims in respect of:

i. the personal injury, illness or death of a Third Party; and/or

ii. the loss of or damage to any facilities, tools, equipment and/or personal belongings of a Third Party; arising in connection with the CONTRACT to the extent caused by the negligence and/or breach of duty (statutory or otherwise) of Contractor Group.

B. Company shall defend, indemnify and hold Contractor Group harmless from and against any and all claims in respect of:

i. the personal injury, illness or death of a Third Party; and/or

ii. the loss of or damage to any facilities, tools, equipment and/or personal belongings of a Third Party; arising in connection with the CONTRACT to the extent caused by the negligence and/or breach of duty (statutory or otherwise) of Company Group.

“Third Party” shall mean a person/entity which is not included in Company Group or Contractor Group.”

#### 3.24.4 **Contractor’s Material, Equipment, Services and Property**

The Unit / equipment / services / tools (herein referred to as Equipment) to be deployed by the Contractor under the Contract shall continue to remain Contractor’s property and shall always remain in the possession / control of the Contractor with the exclusive right to use of such equipment by the Contractor for providing services under the Contract. Contractor shall be responsible at all times, including time in storage, in transit, on the rig or at Company’s well location, for damage to or destruction of Equipment and any other property of Contractor or any of its subcontractors and their respective employees or agents, unless such loss, damage or destruction is caused by or contributed to by the Gross Negligence of Company Group.

#### 3.24.5 **Liability for Radioactive sources**

The radioactive sources, which Contractor may use in performing the Services, are potentially dangerous. If any radioactive source is lost in a well, at the well site, while being transported by or on behalf of Company or by conveyance arranged by the Company or while under the custody or control of the Company or its representatives, Company shall be solely responsible for recovery or abandonment of the source and shall take special precautions in order to avoid breaking or damaging the source container. If the source cannot be recovered, or if the container is broken, Company shall immediately comply with all laws and regulations applicable to Company, as well as to Contractor as owner of the source, including the isolation and marking of the location of the source, and shall defend, indemnify and hold harmless Contractor from and against any and all liabilities arising with respect thereof, and shall keep Contractor informed of all related developments, except when it is caused due to Gross Negligence or Wilful Misconduct by Contractor Group.

#### 3.24.6 **Limitation of Liability**

The total liability of the contractor shall be limited to 100% of the contractor value if no fault by contractor. In case intentional damages, it would be 200% of the contract value. The Company shall indemnify and hold harmless the Contractor against all claims and liabilities in excess of the above limits, provided that aforesaid cap for limitation of liability shall not apply and the Contractor shall continue to remain responsible for all liabilities which arise on account of:

- Breach of Applicable Laws by the Contractor Group.
- Liability for payment or non-payment of taxes and other statutory duties/ fees of any nature.
- Liability for breach of Intellectual Property Rights of any person.
- Breach of Confidentiality obligations.

#### 3.24.7 **Consequential Damage**

Notwithstanding anything else contained herein to the contrary and subject to clause, neither party shall be liable to the other for indirect and consequential damage resulting from, or arising out of this Contract including but not limited to, loss of profit, loss of revenue, anticipated profits, loss of business opportunity or business interruption, suffered by such Party or its Group and each Party shall defend, indemnify and hold the other party harmless in respect thereof.

#### 3.24.8 **Certain Restrictions on Indemnities:**

Unless otherwise expressly admitted elsewhere herein the Contract, no indemnity or hold harmless provision of this Contract shall apply in favour of a Party who shall have caused loss or damage through Gross Negligence or Wilful Misconduct.

#### 3.25 **PERFORMANCE BANK GUARANTEE**

Within fifteen (15) days of the issue of Letter of Intent/ award, the Contractor shall present to the Company a Performance Bond / Bank Guarantee (As per format in accordance to **Annexure #8**) in the form of an irrevocable, unconditional, payable on first demand by Company, divisible bank bond in the format of **Annexure #8** issued by an approved bank. Failure to comply with this condition will constitute grounds for termination of the award / Contract.

The Performance Bank Guarantee shall be of 10% of the contract value and shall be valid and be retained for Ninety (90) Days after the completion/termination of the Contract except where claims are outstanding there under or where previously drawn by the Company but not later than Thirty (30) days after the final settlement of such claims or Ninety (90) Days whichever is

later If the Contractor does not submit the Performance Bank Guarantee as stipulated above, SunPetro reserves the right to cancel the award of LOI / LOA.

Company shall not be liable to pay any Bank Charges, Commissions or Interest on the amount of Performance Bank Guarantee. The performance bond provided by the Contractor is intended to operate as security for amounts (including damages where applicable) which becomes payable by the Contractor by virtue of this Contract and are not intended to be used as a penalty. Without prejudice to it's other rights under the Contract or at law, Company shall be entitled to forfeit the performance bond, should the Contractor fail to perform the Services in accordance with the provisions of the Contract or fail to comply with the provisions of this Contract. The Performance Bank Guarantee shall remain at the entire disposal of Company as Security for the satisfactory commencement, performance and completion of the Scope of Work under the conditions of the Contract / Contract including recovery of amounts due to the Company from the Contractor arising out of this Contract under whatever head.

Company reserves the right to invoke the performance bank guarantee for any of the following reasons including but without limitation to:

- Failure of contractor to start/commence the work as per LOA/LOI/Contract
- If Contractor fails to performs as per the terms and conditions of the contract.
- If contractor fails to perform as per prescribed scope of work.
- If contractor fails to work in work man like manner.
- If tools, machines, parts for the providing services are not fit for the performance of work.
- For breach of contract.

SunPetro will accept the bank guarantee from all public sector banks in India or any of the banks listed in the **Annexure #9**.

### 3.26 **SEVERABILITY**

If any portion of this Contract is determined to be illegal, invalid or unenforceable, for any reason, then, insofar as is practical and feasible, the remaining portions of this Contract shall be deemed to be in full force and effect as if such invalid, illegal or unenforceable portions were not contained herein.

### 3.27 **NON-EXCLUSIVE CONTRACT**

This Contract is non-exclusive and Company reserves the right to engage other contractors to perform similar or identical work. Contractor shall afford such other contractors adequate opportunity to carry out their agreements and shall accomplish the work in cooperation with those contractors and with Company.

### 3.28 **EXPORT CONTROLS**

SunPetro confirms that the Equipment or Services to be provided under this Contract (Collectively 'Items') shall only be for use by it in India for the purpose of production of hydrocarbons. However, if for any reason whatsoever the end use or end user of these Items is required to be changed or if these items are to be taken for use in countries outside India to do any work associated with this Contract, then SunPetro would request the Contractor to obtain consent from the concerned authority in the Contractor's Country. The Contractor shall obtain such consent at its sole risk and costs.

### 3.29 **SPECIAL CONDITION OF THE CONTRACT (SCC)**

3.29.1 The job is to be performed in oil & gas installation, therefore, contractor to ensure all safety precautions as per Oil Mines Regulation Act but not limited to followings:

- i. Contractor to perform the work under valid work Permit only.
- ii. All material supplied at site shall have valid Material Test Certificates from accredited lab/ Test agency / TPI, which shall be new & shall not be older than one year from the date of manufacture.
- iii. Contractor shall submit detailed drawing for the work to be executed before start of work, for approval. After completion of work, 'As Built' drawings shall be submitted.

In case of failure of submission of 'As Built' drawings, payment against the work shall not be released.

- iv. Contractor shall deploy persons who are medically fit & furnish physical Fitness certificate from authorized Medical practitioner.
- v. Contractor to ensure use of proper PPE, HC detector etc. as per requirement of work
- vi. Vessel Entry Permits to be taken before entering into any Vessel
- vii. Contractor to ensure Oxy Acetylene Cylinder Test Certificate, Hose & Gas cutter Test certificates etc. for undertaking fabrication of work.
- viii. Contractor to ensure Welding Generator Electrical Test Certificates, Cables Test Certificate are available before undertaking work.
- ix. All material handling equipment shall have valid load test certificates.
- x. Contractor to ensure transfer of Hazardous Waste / Waste generated during work to earmarked storage place for further disposal by self.
- xi. Contractor to ensure Earth moving / lifting Equipment etc. are deployed have valid certification.
- xii. Bidder shall provide adequate First Aid Kit at site. At least one personnel in Contractor's team shall have proper First Aid Training. Certification for the same shall be provided.
- xiii. Contractor shall have tie up with nearby hospitals in case medical evacuation is required.
- xiv. The Contractor is responsible for implementing any regulations concerning the design, fabrication, inspection and testing of equipment which are mandatory by government of Gujarat.
- xv. Contractor shall get all the drawings approved by the Company before procurement/execution of work. After completion of works, 'As Built' drawings shall be prepared, approved by Company & submitted to Company.
- xvi. Contract shall be for a period of three years with a provision for extension for one more year with the same rates, terms & conditions of the contract.
- xvii. Hired equipment shall be on Call-out basis & prior intimation of 3 days shall be given to the Contractor for mobilizing the equipment at Site.
- xviii. Mobilization & Demobilisation charges are nil & are included in the rate.
- xix. Damage of equipment, if any, during mobilization Commissioning & De-mobilization shall be on account of Contractor.
- xx. Any failure of elements of equipment or system during operation shall be on account of Contractor & the same shall be replaced within 24hrs. Day rate, for equipment during non-availability for Operations are not payable.
- xxi. Penalty Clause
  - i. Delay in Mobilisation of Equipment
  - ii. Breakdown of equipment for more than 24hrs.
  - iii. Violation of use of Personal Protection Equipment
  - iv. Unsafe disposal of waste
  - v. Premature failure of Construction work

#### HSE Consideration

- Contractor Employee Safety Management System implementation
- Calibration & Test certificate:
  1. Cylinder
  2. Hoses
  3. Lifting Equipment
  4. Cables
  - Accident: No compensation
  - Transportation: Contractor scope
  - Mobilization/demobilization: Nil

### 3.29.2 Designing and Engineering:

- i. Specifications and Drawings:

The Contractor shall execute the detailed design and the engineering work in compliance with the provisions of the Contract (including the Technical Specification as per SOW), or where not so specified, in accordance with Good Industry Practice and shall be responsible for ensuring that the facilities are engineered and build to meet all guarantees and acceptance criterion stipulated in the Contract, if applicable. Contractor shall be responsible for any discrepancies, errors or omissions in the specifications including Technical Specifications, drawings and other technical documents whether such specifications, drawings and other documents have been prepared by or reviewed and approved the Company or not.

ii. Codes and Standards:

Wherever references are made in the tender / SOW to codes and standards in accordance with the tender / SOW shall be executed, the edition or the revised version of such codes and standards current at the date of Bid submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied after approval by the Company and shall be treated in accordance with the tender/Contract.

**3.29.3 Clearance of Goods:**

- i. The Contractor shall carryout prior route survey and take appropriate authorities clearance as required for transportation of general cargo and over dimensioned consignments by road/rail wherever applicable.
- ii. Contractor shall arrange for conduction inspection and other surveys with various agencies for all consignments landed in damaged/short supplied condition and corrective action for timely replacement of items.
- iii. The Contractor shall always remain responsible for any loss or damage to the goods thus procured and supplied before these are incorporated in the facility and at all times prior to Operational Acceptance. The Contractor shall apart from its delivery obligations, immediately arrange to replace / repair the lost, defective or damaged goods and supplies entirely at its own cost and irrespective of whether any claim for insurance in respect of such loss or damage, is made by or not.
- iv. Unless otherwise provided in the Contract, the Contractor shall be entitled to select any safe mode of transport for material / equipment of the Contractor.

**3.29.4 Defect Liability:**

- i. The Contractor warrants that the facilities or any part thereof shall be free from defects or failure in the design, engineering, materials and workmanship of the plant and equipment supplied and of the work executed and services provided.
- ii. The Defect Liability Period shall be twelve (12) months after Operational Acceptance or Provisional Acceptance of the facilities unless the Defect Liability Period has been extended or any part of the facilities pursuant to this sub-clause 3.29.4.v. hereof. Should any defect be found during intelligent pigging/pigging process or during Defect Liability Period related to the design, engineering, materials and workmanship of the material and equipment supplied or of the work executed and services provided by the Contractor, the Contractor shall promptly, in consultation and agreement with the Company regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good to the full satisfaction of the company such defect as well as any damage to the facilities caused by such defect. The burden of proof of remedy of the defects shall be on the Contractor. Contractor shall reimburse Company all such costs including cost towards loss of oil/gas incurred by Company due to such defects.
- iii. The Company shall give the Contractor a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. The Company shall

afford all reasonable opportunity for the Contractor to inspect any such defects and all necessary access to the facilities and the site to enable Contractor to perform its obligations under the clause.

- iv. If the Contractor fails to commence the work necessary to remedy such defect or any damage to the facilities caused by such defect within a reasonable time (not more than 15 days), the Company may, proceed to do such work, and the costs and expenses incurred by the Company in connection therewith shall be paid to the Company by the Contractor or may be deducted by the Company from any monies due to the Contractor or claimed under the Performance Bank Guarantee.
- v. If the facilities or any part thereof cannot be used by reason of such defect and/or any making good of such defect, the Defect Liability Period of the facilities or such part, as the case may be, shall be extended by a period equal to the period during which the facilities or such part cannot be used by the Company because of any of the aforesaid reasons.
- vi. This clause shall also be applicable if any defect or failure is detected during Intelligent Pigging/Pigging Process whenever it is carried out till defect liability period.

### **3.29.5 Land for Contractor's Office, Godown and Workshop:**

Unless otherwise specified in the Bid documents, the Contractor shall, as required for his works, for the entire duration of the execution of the work arrange near the Site, land for construction of equipment stock yards, maintenance work shops, field offices and warehouses and for any purpose in connection with providing infrastructure required for the execution of the Contract. The Contractor shall bear all the cost related to the provisions of the site / land and sanitary arrangement as required without any recourse to the Company.

On completion of the work undertaken by the Contractor, the Contractor shall remove all temporary works and have the Site cleared as directed by the Company. If the Contractor fails to comply with these requirements, the Company may, at the expenses of the Contractor, remove such surplus and rubbish materials and dispose the same as the Company deems fit and get the site cleared at the risk and cost of Contractor.

Land for residential accommodation for staff and labour of Contractor shall, if so required by him, be arranged by Contractor at his own cost and risk with no recourse to the Company.

### **3.29.6 Quality Assurance System:**

The provisions related to Quality Assurance System shall be as per the Technical Specifications and the Scope of Work.

- 3.29.7 The quoted lump sum prices for various items are deemed to have appropriately catered for all mobilization, demobilization and all clearing of activities at all the sites and no separate claim whatsoever is allowed. Including carrying out detailed engineering for laying pipelines & preparation of 'As Built' drawings of pipelines & CPF.

### **3.29.8 Payment Terms:**

100% payment within 30 working days on submission of certified undisputed Invoices along with job report / documents etc as specified in the Contract after completion of work.

- 3.29.9 In the conduct of Petroleum Operations, the Contractor shall:

- (a) give preference to the purchase and use of goods manufactured, produced or supplied in India provided that such goods are available on terms equal to or better than imported goods with respect to timing of delivery, quality and quantity required, price and other terms;



- (b) employ Indian subcontractors having the required skills or expertise, to the maximum extent possible, insofar as their services are available on comparable standards with those obtained elsewhere and on competitive terms; provided that where no such subcontractors are available, preference may be given to non-Indian Subcontractors who utilize Indian goods to the maximum extent possible, subject, however, to the provision in Para (a) above;
- c) In this Clause, goods means equipment, materials and supplies

**3.29.10 Price Escalation:** To mitigate the fluctuation of rates due to inflation after 1 year, SunPetro may review escalation in prices linked with Overall all Commodities Wholesale Price Index (WPI) as announced by the Government of India after completion of 1 year.

Contract price will remain fixed for the 1<sup>st</sup> Year & will be base price for considering the escalation for subsequent years. I.e. Contract Price & (WPI) Index of bid closing date will be considered as base for any calculation / escalation. However, the escalation consideration by the Company will be subject to reasonably good performance by the Contractor & at sole discretion of SunPetro.

## **SECTION-4**

### **SCOPE OF WORK, RESPONSIBILITY MATRIX, BID EVALUATION CRITERIA & PRICE SCHEDULE**

**(Enclosed)**





REQUEST FOR QUOTATION FOR  
CONSTRUCTION CONTRACTOR: MECHANICAL,  
PIPING, ELECTRICAL AND INSTRUMENT &  
CONTROL



DOC. NO: BHII-CPF-MEC-RFQ-003

CLIENT: SUN PETROCHEMICALS PVT LTD

-




PROJECT NO: 23134



PROJECT: CENTRAL PROCESSING FACILITY  
AUGMENTATION

REV: 00

**REQUEST FOR QUOTATION  
FOR CONSTRUCTION CONTRACT  
OF  
MECHANICAL, PIPING, ELECTRICAL,  
INSTRUMENT & CONTROL**

**Document No: BHII-CPF-MEC-RFQ-003**

					
00	05/10/2023	ISSUED FOR REVIEW	MM	KS	SPV
REV	DATE	PURPOSE	PREPARED BY	CHECKED BY	APPROVED BY

										<b>REQUEST FOR QUOTATION:</b> Construction Contract - Mech, Piping, Electrical, Instrumentation & Control <b>TAG NO:</b> MEC-RFQ-003_R0 <b>TOTAL QTY:</b> 1 Lot <div style="text-align: right;">Sht.: 1 of 1</div>									
				JOB NUMBER		AREA		DIC.		CODE		NUMBER		REV					
<b>RFQ NUMBER</b>				X	X	X	X	C	P	F	M	C	<b>RFQ</b>		<b>003</b>		<b>0</b>		
<b>ALWAYS QUOTE THIS NUMBER AS OUR REFERENCE</b>																			
CLIENT				PROJECT				VENDOR				MATERIAL REQUIRED AT DESTINATION LATEST BY:							
 <b>SUN PETROCHEMICALS PVT. LTD.</b>				CENTRAL PROCESSING FACILITY AUGMENTATION				TBA											
														DELIVERY ITEM NO.					
ALL ATTACHMENT MENTIONED HEREIN ARE INTERNAL PART OF THIS REQUISITION AND MUST BE CONSIDERED																			
<b>LIST OF ATTACHMENTS</b>												<b>REVISION NUMBER OF THE REQUISITION</b>							
SR. NO.		DOCUMENT NUMBER & DESCRIPTION										0	1	2	3	4			
<b>A</b>		<b>INVITATION TO TENDER (ITT)</b>																	
<b>B</b>		<b>BID EVALUATION CRITERIA (BEC)</b>																	
<b>1</b>		<b>SCOPE OF WORK (SOW)</b>																	
(a)	BHII-CPF-PM-SOW-1005	CONSTRUCTION CONTRACTOR SCOPE OF WORK - PROJECT MANAGEMENT										0							
(b)	BHII-CPF-MEC-SOW-2016	CONSTRUCTION CONTRACTOR SCOPE FOR MECHANICAL AND PIPING WORKS										0							
(c)	BHII-CPF-ELE-SOW-5021	CONSTRUCTION CONTRACTOR SCOPE FOR ELECTRICAL WORKS										0							
(d)	BHII-CPF-INS-SOW-6014	CONSTRUCTION CONTRACTOR SCOPE FOR INSTRUMENTATION WORKS										0							
<b>2</b>		<b>SCHEDULE OF RATES (SOR)</b>																	
(a)	BHII-CPF-MEC-SOR-2018	SCHEDULE OF RATES (SOR) MECHANICAL										0							
(b)	BHII-CPF-PIP-SOR-3047	SCHEDULE OF RATES (SOR) PIPING										0							
(c)	BHII-CPF-ELE-SOR-5025	SCHEDULE OF RATES (SOR) FOR ELECTRICAL										0							
(d)	BHII-CPF-INI-SOR-6033	SCHEDULE OF RATES (SOR) INSTRUMENTATION & CONTROLS										0							
<b>3</b>		<b>RESPONSIBILITY MATRIX</b>																	
<b>4</b>		<b>SUGGESTED VENDOR LIST</b>																	
<b>5</b>		<b>PIPING MATERIAL SPECIFICATION</b>																	
<b>6</b>		<b>EQUIPMENT LIST</b>																	
<b>NOTES:</b> 1 All revisions of the material requisition and its attachments shall be retained. In case of change, only revised pages of attachments will be issued except while issuing order. 2 All changes described on the 'change description' summarize revisions only.																			
0	05/10/2023	Issued for review										MM	KS	SPV					
Rev	Date	Description										Prepd. by	Chkd By	App. By					

**Tender: SITE CONSTRUCTION ACTIVITIES FOR CPF AUGMENTATION PROJECT****RFQ No.: MEC-RFQ-003\_R0****TECHNICAL BID EVALUATION CRITERIA (BEC)**

Sr. No.	DESCRIPTION	BIDDER TO COMPLETE THIS SECTION
	The bids shall conform to the specifications, terms and conditions given in the tender. Bids shall be rejected in case the item(s) offered do not conform to technical requirements.	
A	<b>BID EVALUATION CRITERIA:</b>	
1	<b>Bidder's Qualification:</b>	
1.1	The bidder shall possess experience of executing site works on item rate covering supply, erection, testing and commissioning of plant and equipment across disciplines namely Mechanical, Piping, Electrical and Instrumentation.	
2	<b>Bidder's Experience:</b>	
2.1	The bidder shall have an experience of having successfully executed 2 (two) projects including supply and execution of works across all disciplines in last five (10) years in Oil & Gas Industry, which should under satisfactory operation for last 5 years.	
2.2	Bidder to submit the Documentary evidence for the units supplied in the past: The following documentary evidence to substantiate experience records of the bidder must be submitted along with the technical bid, failing which the Bid shall be treated as incomplete and rejected:	
	a) Copy of Purchase order(s)	
	b) Copy of contract(s) awarded by Client(s)	
	c) Copy of Tax Invoice/Commercial Invoice	
	d) True copies of completion certificate (on Client's/User's official letter head with signature & stamp).	
3	<b>HSE Requirements</b>	
3.1	Bidder to confirm compliance to the HSE requirements and shall demonstrate HSE performance in the past projects.	
3.2	Bidder to submit copy of HSE manual and procedures to demonstrate compliance to HSE requirements.	
3.3	LTI Track records for last 5 years along with the incident reports shall be submitted along with bid.	
4	<b>Quality Requirements</b>	
4.1	Bidder to submit copy of QAP and demonstrate that quality requirements are achieved in past projects. Should submit quality records to support the rate of rework.	
5	<b>Technical Requirements</b>	
	1. Compliance to technical specification.	
	2. Project Schedule – Ability to complete work within desired time frame	
	3. Execution Plan and methodology of performing work	
	4. Performance Track Record/Relevant experience	
	5. Current Work load and reserve capacity	
	6. Availability of capable resources – human, facilities and IT infrastructure	
	7. Project organization, key personnel experience and qualifications	
	8. Mobilization plan	
	9. Compliance to Company's Quality Assurance and Control Systems requirement	
	10. Compliance to Company's HSE requirements and Contractor's HSEMS System	
	11. Availability of Construction equipment, tools and tackles	
	12. Employee and industrial relations	
	13. Local employment strategy of the Contractor	
	14. Indian and Local Content of the bid	
	15. Vendor Capabilities to execute complete scope	
	16. Compliance to Contractual terms and condition	
6	<b>EXCEPTION/DEVIATION/CONDITIONS PROFORMA</b>	



**CONSTRUCTION CONTRACTOR SCOPE OF  
WORK (PROJECT MANAGEMENT)**



**DOC. NO.:** BHII-CPF-PM-SOW-1005

**CLIENT:** SUNPETROCHEMICALS PVT LTD.




**PROJECT NO.:** 23134



**PROJECT:** CENTRAL PROCESSING FACILITY  
AUGMENTATION (FOR 12000 BOPD)

**REV.:** 0

**CONSTRUCTION CONTRACTOR SCOPE OF WORK  
(PROJECT MANAGEMENT)**



**Document No: BHII-CPF-PM-SOW-1005**

					
0	05.10.23	Issued for Client review	MM	KS	SPV
REV	DATE	PURPOSE	PREPARED BY	CHECKED BY	APPROVED BY



	CONSTRUCTION CONTRACTOR SCOPE OF WORK (PROJECT MANAGEMENT)	
<b>DOC. NO.:</b> BHII-CPF-PM-SOW-1005	<b>CLIENT:</b> SUN PETROCHEMICALS PVT LTD.	
<b>PROJECT NO.:</b> 23134	<b>PROJECT:</b> CENTRAL PROCESSING FACILITY AUGMENTATION (FOR 12000 BOPD)	<b>REV:</b> 0

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## SECTION – 1: PROJECT INFORMATION

### A. PROJECT INFORMATION

#### 1.0 INTRODUCTION

Sun Petrochemicals Private Limited (SunPetro) plans to enhance the capacity of the CPF at Bhaskar onshore field at Anand district of Gujarat, on EPC-M basis. SunPetro plans to connect more wells to the existing CPF. Based on the CPF gap analysis study done by Global Maritime Consultants Group (GMCG) and as per Client preference it is concluded that the existing facility with minimum modifications, can help enhance production from current 7000 BOPD to 12000 BOPD. All documents are to be updated accordingly for all the engineering and delivery requirements.

GMCG Maritime Consultants Pvt Ltd has been contracted by Sun Petrochemicals Private Limited to execute relevant engineering and associated modifications in the onshore central processing facility (CPF).

#### 2.0 PROJECT DETAILS

##### 2.1 GENERAL

- Client/Company : SUNPETROCHEMICALS PVT LTD.(SPPL) , KHAMBHAT
- Consultant : Global Maritime Consultants Group (GMCG)
- Project Title : Central Processing Facility Augmentation (12000BOPD)
- Project Location : Khambhat, Gujarat, India

##### 2.2 SCOPE

The brief scope of CPF augmentation project for increase in production capacity from 7000 BOPD to 12000 BOPD will involve, installation of new well fluid-crude oil interchanger (E-101), 2 nos Feed booster pumps (P-101 C/D), 2 nos Export oil pumps (P-102 C/D), relocation of tank bottom circulation pumps (P-104A/B) and relocation of drain pumps (P- 117 A/B).

The scope shall cover work across disciplines mechanical, Piping, Electrical, Instrumentation and controls.



The scope is classified into supply, installation, mechanical completion, pre-commissioning and commissioning. The details of supply and installation scope is covered under respective discipline Scope of work (SOW) and the associated Schedule of rate (SOR).

All quantities mentioned in SOR are estimated only which may vary as per site condition and

contractor is responsible to consider appropriate quantities to complete the work.



CONTRACTOR is hereby advised to visit the site at their cost prior to submission of bid and apprise himself of existing site condition at CPF.



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### 3.0 PROJECT MANAGEMENT & PROGRESS REPORTING

- 3.1 Bidders shall submit preliminary execution philosophy to cover the scope of work across disciplines and execution methodology
- 3.2 Preliminary Project quality plan (PQP) shall be submitted to cover the execution.
- 3.3 All the contractors have to identify following representatives from their organization at the beginning of the project.
  - 3.3.1 Site Manager / site In charge
  - 3.3.2 Project Coordinator
- 3.4 Kick off meeting - Prior to site mobilization, contractor will submit overall project execution schedule, after due review of the site, material, labor & other resources and available fronts during KICK –OFF meeting.
- 3.5 Every week (on a predefined day) there will be one review meeting in which the contractor has to submit updated project schedule and progress report. Any incomplete activity of previous week (which could not have been completed for any reasons beyond contractor's control) + the planned progress for current week has to be presented (2 to 3 days prior to meeting) & discussed by the contractor and further develop a recovery plan for slippage / delay in schedule.
- 3.6 Contractor must also submit plan for the next week by end of the last day of every week and get it signed off from SunPetro.
- 3.7 Any constraints caused by other agency must be pointed out to SunPetro for early resolution.
- 3.8 At the end of every meeting, the contractor must submit Minutes of the meeting and get it signed off from SunPetro.
- 3.9 SunPetro / their representative have to certify stage wise completion of the overall work and Contractor must get this duly verified at every fortnight.
- 3.10 The contractor has to submit QAP for the work one week in advance to site project manager of SunPetro & obtain approval before starting the activity
- 3.11 Contractor shall arrange the following:
  - A. Electric Power – This will be made available at the Owner's substation and contractor has to extend it in a safe and disciplined way to their work area distribution board. Contractor has to indicate the power requirement while submitting the bid. The sub distribution of the Electrical supply shall be installed in a covered area to protect against rain / bad weather & will consists of suitably rated Incomer MCCB with tested / certified Energy Meter, indicating lamps etc., suitable rated RCBO's , indicating lamp & interlocked

	CONSTRUCTION CONTRACTOR SCOPE OF WORK (PROJECT MANAGEMENT)	
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plug-sockets. The electric supply would be charged based on the usage. The 'per unit charge' should be conformed to SunPetro.

- B. Construction & drinking Water to be arranged by contractor.
- C. Work area allocation to the various agencies working at the site will depend upon the availability of space & the requirement of bidder. Therefore, bidder must indicate the space requirement in the bid. Worker's accommodation will not be provided.
- D. Each contractor has to have minimum following facilities. These facilities are to be created by the contractor at the beginning of site and demolish/remove the same prior to demobilization and the contractor has to clean & level the work area before handing over to SunPetro.
  - Site office cum stores / Material storage area & time office
  - Fabricating area / work shop
  - Electrical panel area
  - Temporary civic amenities

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#### 4.1 CHECK LIST / LIST OF DOCUMENTS

Bidder has to submit following documents / check list along with bid.

##### A. Check list-

Please ensure following and confirm compliance by signing off with seal of the authorized signatory.

1. Have you fully understood the scope of work and terms / Conditions of this contract?

Yes ☐ No ☐

2. Have you furnished the information in given formats?

Yes ☐ No ☐



##### B. Format of Information-

Sr. No.	Item Description	Estimated Quantity	Remarks
1	Electric Power (KW)		
2	Water ( m <sup>3</sup> /day)		
3	Work area (Sq. Mtrs)		

##### C. Deviation List-

Sr. No.	Tender Reference	Description of Deviation	Remarks

**SIGNATURE WITH SEAL OF AUTHORISED SIGNATORY**

	CONSTRUCTION CONTRACTOR SCOPE OF WORK (PROJECT MANAGEMENT)	
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## **B. TECHNO-COMMERCIAL**

### **1.0 SECURITY WATCH & WARD**

By M/s. SPPL

### **2.0 GENERAL DEFINITION OF COMMERCIAL TERMS**

By M/s. SPPL

### **3.0 STATUTORY REQUIRMENTS**

By M/s. SPPL

### **4.0 PRICE QUOTATION FORMAT**

By M/s. SPPL

### **5.0 TAXES & DUTIES**

By M/s. SPPL

### **6.0 GENERAL COMMERCIAL CONDITIONS OF CONTRACT**



By M/s. SPPL

### **6.0 SPECIAL CONDITIONS OF CONTRACT**

By M/s. SPPL

### **7.0 COMMERCIAL TERMS & CONDITIONS**

By M/s. SPPL

	CONSTRUCTION CONTRACTOR SCOPE OF WORK (PROJECT MANAGEMENT)	
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## SECTION - 2: MATERIAL TAKE-OFF



### 1.0 MATERIAL TAKE-OFF

The material take off is covered in the respective drawings and documents of respective discipline. The same shall be used for reference, however Contractor shall verify the correctness of the same and shall consider necessary construction contingency as required.

### 2.0 NOTES

2.1 Any additional item required to be supplied & installed by the contractor shall be paid as follows:

1. Contractor shall submit 3 nos. quotations & obtain approval from SunPetro before procurement.
2. SunPetro shall reimburse the purchase price plus 10% handling charges if in case SunPetro provides material.
3. Installation commissioning charges shall be same, as paid for similar items.
4. Decision of SunPetro shall be final in this regard.

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## SECTION – 3: HEALTH, SAFETY & ENVIROMENT

### 1.0 SCOPE

This specification establishes the Health, Safety and Environment (HSE) management requirement to be complied by Contractor (including sub-contractors) during construction. Requirements stipulated in this specification shall supplement the requirements of HSE Management given in relevant Act(s) / legislations, General Conditions of Contract (GCC), and Job (Technical) Specifications. Where different documents stipulate different requirements, the most stringent shall apply.

### 2.1 REFERENCES

The document should be read in conjunction with following:

- General Conditions of Contract (GCC)
- Scope of work for Mechanical and Piping – Annexure-1
- Scope of work for Electrical – Annexure-2
- Scope of work for Instrumentation and Controls – Annexure-3

### 3.0 ACCIDENT INVESTIGATION

Although utmost care has to be taken by the contractor to ensure accident less working. But in the event of an accident, contractor will immediately inform the owner and organize rescue & medical help.

All accidents shall be investigated by a team of Contractor's senior personnel & SunPetro's representative for establishing root cause and recommending corrective & preventive actions. Findings shall be documented and suitable actions taken to avoid recurrences & shall be circulated among all contractors at site.

SunPetro shall have the liberty to independently investigate such occurrences and the Contractor shall extend all necessary help and cooperation in this regard.

### 4.0 CONSTRUCTION HAZARDS



Contractor shall ensure that during the performance of the work, all hazards have been identified, assessed and eliminated.

### 5.0 ACCESSIBILITY

The Contractor shall provide safe means of access to any working place including provisions of suitable and sufficient scaffolding at various stages during all operations of the work for the safety of his workmen and SunPetro / PMC.

### 6.0 WORKING AT HEIGHT

The contractor shall take height permit for working above 2 meters height after verifying and certifying the checkpoints to be developed during the execution of the job. He shall also undertake to ensure compliance to the conditions of the permit during the currency of the permit including

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adherence to personal protective equipment. The permit shall be issued initially for one week or expected duration of an activity and extended further for the balance duration. This permit shall be applicable in areas where specific clearance from SunPetro's operation Depts. / Safety Depts. is not applicable. EPMC field Engineers/Safety Officers/Area Coordinators may verify and sign this permit during the execution of the job. In case work is undertaken without taking sufficient precautions as given in the permit, EPMC Engineers may cancel the permit and stop the work till satisfactory compliance is arranged. Contractors are expected to maintain a register for issuance of permit and extensions thereof including preserving the used permits for verification during audits etc.

Contractor shall arrange (at his cost) and ensure use of Fall Arrester Systems by his workers. Fall arresters are to be used while climbing tall structures. These arresters should lock automatically against the anchorage line, restricting free fall of the user. The device is to be provided with a double security opening system to ensure safe attachment or release of the user at any point of rope. In order to avoid shock, the system should be capable of keeping the person in vertical position in case of a fall.

Contractor shall ensure that Full body harnesses conforming to EN361 and having authorized Ca E marking are used by all personnel while working at height. The lanyards should be strong enough to take the load of the worker in case of a fall. One end of the lanyard shall be firmly tied with the harnesses and the other end with a fixed & rigid structure. The FBH should have BIS marking also.

Contractor shall provide Roof Top Walk Ladders for carrying out activities on sloping roofs in order to reduce the chances of slippages. Contractor shall ensure that a proper Safety Net System is used wherever the hazard of fall from height is present. The safety net shall be located not more than 9.0 meters below the working surface extending on either side up to sufficient margin to arrest or to reduce the consequences of a possible fall of persons working at different heights.

## 7.0 WELDING / GAS CUTTING

Contractor shall ensure that flash back arresters conforming to BS: 6158 or equivalent are installed on all gas cylinders while in use. All cylinders shall be mounted on trolleys. All welding machines shall have effective earthing. To eliminate radiation hazard, Tungsten electrodes used for Gas Tungsten Arc Welding shall not contain Thorium. Proper PPE should be used during welding, cutting, grinding etc.



## 8.0 OCCUPATIONAL HEALTH HAZARD

The contractor shall identify all operations that can adversely affect the health of its workers and issue & implement mitigation measures. For surface cleaning operations, sand blasting shall not be permitted even if not explicitly stated elsewhere in the contract.

## 9.1 RECORDS

The contractor shall maintain/ submit HSE records as under:



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- Monthly HSE Checklist cum compliance report
- Accident/ Fire Report
- Supplementary Accident & Investigation report
- Monthly HSE Report
- Permit for working above 2 meter height
- HSE Plan

## 10.0 FIRST AID

By M/s. SPPL

## 11.0 SAFETY RULES & REGULATIONS



By M/s. SPPL

## 12.0 SAFETY OF PERSONNEL & EQUIPMENT

- 12.1 The regulation for the safety of personnel and equipment as stipulated by the principal and as required by the local authorities shall be strictly adhered to. All personnel shall be fully aware of this regulation, and shall know the arrangement for first aid, medical facilities, fire-fighting equipment and general emergencies.
- 12.2 Contractor shall ensure that work procedures followed shall be in no way jeopardize the safety of his staff or those of other contractors & owner.

## 13.0 FIRE PREVENTION

- 13.1 Smoking shall be strictly prohibited in the areas where inflammable and combustible materials are stored or handled. This is valid for areas where such material is handled in closed containers or pipelines.
- 13.2 Contractor shall ensure that only DA & Oxygen cylinders shall be used for gas cutting and LPG cylinders are not allowed.
- 13.3 Contractor shall ensure that drives (grinding machine etc.) used during the execution must be provided with protective safety guards.
- 13.4 All tools, tackles & lifting equipment must have been tested and certified for their intended use.
- 13.5 All equipment or tools to be used in areas classified as hazardous shall be of approved explosion proof design, unless the area has been cleared, ventilated and certified by as being safe from hazard.
- 13.6 Charged and operative fire extinguishers shall be located near the work place when welding or heating operation is carried out in field.
- 13.7 Fire proof fabric or metallic barriers shall be put on combustible materials or installation near the place of welding at site.

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13.8 While welding is carried out at site, the earth or return current cable shall be clamped nearest to the member on which welding is being carried out to avoid sparking and overheating elsewhere.

13.9 No electrical equipment enclosure shall be opened or dismantled unless isolated elsewhere.

#### **14.0 PERSONNEL SAFETY GEAR**

14.1 Safety goggles shall be used where potential eye hazards are present. Full face shield shall be worn while grinding, chipping.... Etc.

14.2 Safety shoes shall always be used in the construction area.

14.3 Hearing protection shall be worn when working in excessively noisy area.

14.4 Head protection helmets shall always be used at all times in the construction area.

14.5 Respiratory protection of suitable type shall be used when exposed to harmful gases or their immediate hazard.

14.6 Safety harness / safety belt of approved type shall be used by all personnel working at elevation.

#### **15.0 FIRST AID & HOUSE KEEPING**

1.1 Construction area, especially operating / running plant area shall always be kept clean of installation debris.

1.2 Oil, grease, and other liquid spilling shall be attended immediately and area cleaned up.

1.3 Each working group shall be responsible for housekeeping in their respective working area.

#### **16.0 WORK PERMITS**

##### **16.1 Cold Permits:**

The permit shall be taken for all general works of maintenance in a plant and for equipment that does not involve activities related to hot works as described later. The permit shall be taken in line with the approval permit forms and as per the safety manual.

##### **16.2 Hot Work / Vehicle Entry permits where ever applicable:**



A hot work permit / vehicle entry permit shall be taken for any work to be carried out in restricted / Hazardous area involving the use of local sources of ignition flammable gases, liquids or any other material. Examples are welding, burning, grinding, blasting, soldering, any open fire work, use of certain non - explosion proof equipment in gaseous area etc.

##### **16.3 Permission to excavate:**

Excavation authorization permit shall be arranged in appropriate forms for all excavations regardless of depth. Permit shall be obtained prior to start of excavation.

##### **16.3.1 Material**

Any discrepancies between the equipment specified and the equipment provided, or any defects discovered therein, shall be brought to the notice of the construction team without delay. All material supplied by the contractor shall be approved.

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### 16.3.2 Housekeeping

Good housekeeping practices shall be maintained throughout in order to provide condition where maximum safety and efficiency may be achieved. Scarp materials and rubbish shall be collected daily and deposited at approved locations.

## 17.0 CONSTRUCTION PLANT AND EQUIPMENT

All Construction Plant and Equipment, Temporary Works and materials provided by the Contractor shall, when brought on the Site, be deemed to be exclusively intended for the Construction and completion of the Works. The Contractor shall not remove or demobilize any or any part of them without a written consent of the Company's Representative. All materials and consumables procured by the Contractor and brought on to site including but not limited to scrap, left over excess materials and salvaged materials shall remain the property of the Company and under no circumstances shall this be taken back by the Contractor on Completion of all works. However, all Plant and Equipment brought by the Contractor for construction activities shall be demobilized on completion of all Works after seeking written consent from the Company.

## 18.0 SHUT DOWN REQUIREMENTS

The works covered under this contract are to be hooked up with the existing facilities/ plants as detailed in sow documents. Contractor shall examine the scheme of hook-up and submit to the Company a schedule of minimum essential shutdown required.



## CONSTRUCTION CONTRACTOR SCOPE FOR MECHANICAL AND PIPING WORKS



**DOC NO:** BHII-CPF-MEC-SOW-2016

**CLIENT:** SUN PETROCHEMICALS PVT LTD.

**REV:** 0




**PROJECT NO:** 23134



**PROJECT:** CENTRAL PROCESSING FACILITY  
AUGMENTATION (FOR 12000 BOPD)

**DATE:** 05/10/2023

## CONSTRUCTION CONTRACTOR SCOPE FOR MECHANICAL AND PIPING WORKS



**Document No: BHII-CPF-MEC-SOW-2016**

					
0	05.10.2023	Issued for Review	MM	KS	SPV
REV	DATE	PURPOSE	PREPARED BY	CHECKED BY	APPROVED BY

	<b>CONSTRUCTION CONTRACTOR SCOPE FOR MECHANICAL AND PIPING WORKS</b>	
<b>DOC NO:</b> BHII-CPF-MEC-SOW-2016	<b>CLIENT:</b> SUN PETROCHEMICALS PVT LTD.	<b>REV.:</b> 0
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## 1. INTRODUCTION

Sun Petrochemicals Private Limited (SunPetro) plans to enhance the capacity of the CPF at Bhaskar onshore field at Anand district of Gujarat, on EPC-M basis. Sun Petro plans to connect more wells to the existing CPF. Based on the CPF gap analysis study done by Global Maritime Consultants Group (GMCG) and as per Client preference it is concluded that the existing facility with minimum modifications, can help enhance production from current 7000 BOPD to 12000 BOPD. All documents are to be updated accordingly for all the engineering and delivery requirements.

GMCG Maritime Consultants Pvt Ltd has been contracted by Sun Petrochemicals Private Limited to execute relevant engineering and associated modifications in the onshore central processing facility (CPF).

## 2. PROJECT DETAILS

### 2.1. GENERAL

CLIENT / OWNER	Sun Petrochemicals Pvt Ltd
CONSULTANT	GMCG Maritime Consultants Pvt Ltd
OEM / VENDOR	The Party who supplies or manufactures the equipment's
CONTRACTOR	The Party who erects the plant in the site
PROJECT TITLE	Central Processing Facility Augmentation (12000BOPD)
SITE	Site refers to Construction Site - BHASKAR onshore field at Anand district of Gujarat

### 2.2. MEASUREMENT & CALIBRATION UNITS

Unless otherwise specified, electrical and control systems shall be measured & recorded in MKS units only.

### 2.3. TYPE OF TENDER



This is an item rate Contract and Contractors / Bidders are requested to submit quotations as per Annexure. Compliance with Specifications is required by the Consultant.

This project is subdivided into two parts: Mechanical equipment erection work

The piping part covers above ground pipework design, supply, erection, and testing that will be required at the terminals.

### 2.4. SCOPE OF WORK

This is an item rate construction contract for various types of mechanical equipment and piping. Scope includes Supply (as applicable), Erection & Commissioning of Mechanical and Piping

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items. The successful bidder shall be provided with relevant drawings & documents.



## 2.5. ABBREVIATIONS

ANSI	American National Standard Institute
ASME	American Society of Mechanical Engineers
IS	Indian Standards
NDT	Non-Destructive Testing
MOC	Material of Construction
PFD	Process Flow Diagram
P & ID	Piping and Instrument Diagram
PRV	Pressure Relief Valve
PMS	Piping Material Specification
FGL	Finished Grade Level /FFL-Finished Floor Level
C.S.	Carbon Steel
A.S.	Alloy Steel
S.S.	Stainless Steel
RF	Raised Face
FF	Flat Face
SWG	Spiral Wound Gasket
OISD	Oil Industry Safety Directorate
PESO	Petroleum and Explosives Safety Organization
DGMS	Directorate General of Mines Safety
OMR	Oil Mines Regulations
GPCB	Gujarat Pollution Control Board
TPI	Third Party Inspection
ROU	Right of Use
CCOE	Chief Controller of Explosives
WPS	Welding Procedure Specification

## 2.6. MAJOR REFERENCE CODE & STANDARDS

ASME B16.34	Valves Flanged Threaded and Welding End
ASME B31.3	Process Piping
ASME B31.4 Liquids	Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids
ASME B31.8	Gas Transmission & Distribution Piping Systems





	<b>CONSTRUCTION CONTRACTOR SCOPE FOR MECHANICAL AND PIPING WORKS</b>	
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ASME B16.11	Forged Steel Fittings
ASME B16.5	American Standard for Flanges and Flanged Fittings
ASME B16.9/16.11	American Standard for Butt Weld/Socket Weld Fittings
ASME B36.10/36.19	American Standard for Pipe Dimensions CS &SS
ASME B18.2.1/18.2.2	Dimensional standard for nut-bolt
ASME B16.10	Dimensions of Valves
ASME B16.20	Metallic Gaskets for Pipe Flanges
ASME B16.21	Non-Metallic Flat Gaskets for Pipe Flanges
ASME B16.25	Butt weld Valves
ASME B.1.20.1	Precision Pipe Fittings
ASME 16.34	Stainless Steel Gate, Globe, Check Valves
ASME B36.19	Stainless Steel Pipe Dimensions
MSS SP25	Gate, Globe & Check Valve Marking
API-5L	Specification of line pipe
API RP 1102	Steel Pipeline Crossing Railways & Highways
API STD 1104	Standard for Welding Pipelines and Related Facilities
API 1105	Bulletin on Construction Practices for Oil and Product Pipelines
API RP 1109	Marking Liquid Petroleum Pipeline Facilities
API RP 1110	Recommended Practice for the Pressure Testing of Liquid Petroleum Pipelines

#### **Oil Industries Safely Directorate (OISD) and Indian Standards (IS)**

OISD-STD-106	Pressure Relief & Disposal System
OISD-STD-109	Process Design and Operation philosophies on blow down and sewer system.
OISD-STD-108	Recommended Practices on Oil Storage and Handling
OISD-STD-130	Inspection pipes valves and fittings
OISD-STD-118	Layouts for Oil and Gas Installations
OISD-STD-226	Natural Gas Transmission Pipelines and City Gas Distribution Networks
OISD-GDN-233	Standard on non-piggable pipelines

Any other codes and standards not specifically listed here in but required for successful completion of the work.

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### 3. SCOPE OF WORK FOR MECHANICAL WORKS

#### 3.1. GENERAL

- 3.1.1. The CONTRACTOR is responsible for disassembling and relocating the existing Well Fluid - Crude Oil Heat exchanger (E-101/102) from its present position.
- 3.1.2. The heat exchanger E-101/102 removal will need introduction of a piping bypass to allow continuous operation. Contractor is expected to identify the bypass location and accordingly piping will be able to undertake the design and issue design drawings for fabrication.
- 3.1.3. Heat exchanger upon decommissioning shall be relocated to warehouse and shall be cleared of hydrocarbon. The heat exchanger shall be purged with nitrogen for long term storage.
- 3.1.4. The dismantled heat exchanger shall be relocated to warehouse.
- 3.1.5. The new heat exchanger (E-101) is a replica of the existing and the nozzle locations will be followed as per the existing unit currently in operation.
- 3.1.6. The CONTRACTOR is required to utilize the existing piping configurations and routing for the installation of the new heat exchanger. Additionally, should the new exchanger require any modifications in piping the same shall be the responsibility of the CONTRACTOR.
- 3.1.7. Dismantling and relocation of Drain pumps (P-117A/B) from the current location to the new proposed location
- 3.1.8. Dismantling and relocation of Tank bottom recycle pumps (P-104 A/B) from the current location near the existing pump house to the new proposed location.
- 3.1.9. Installation of new crude oil feed booster pumps (P-101 C/D) in the proposed location, shown in the piping drawing.
- 3.1.10. Installation of new Crude oil export main pump (P-102 C/D) in the proposed location, shown in the piping layout drawing.
- 3.1.11. Throughout the on-site execution, the Contractor must promptly address and resolve any issues that may arise, demonstrating an ability to troubleshoot effectively. Collaborative decision-making with SunPetro is essential in finding and implementing the most favorable solutions to encountered challenges (ex. Changes in Pipe routing, Civil foundations, etc.,)



#### 3.2. ERECTION

- 3.2.1. Erection / installation work would be carried out independently by CONTRACTOR for equipment. However, for Packaged items and Machinery items the erection shall be carried independently or under package vendor's supervision and instructions.
- 3.2.2. The CONTRACTOR is responsible for coordination with OEM is necessary prior to the decommissioning and removal.
- 3.2.3. The installation would be carried out by standard industrial practices, and relevant codes and standards.
- 3.2.4. Whenever conflicts exist between the Package vendor's instructions, this Specification, other specifications, the drawings, or codes, the COMPANY's Site Construction

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Manager shall be notified and shall provide the final resolution.

- 3.2.5. The CONTRACTOR will provide supervision, labour, equipment, materials, tools, and all other supplies, (unless specifically noted as being provided by others) to perform the work described there in accordance with the document and the referenced specification.
- 3.2.6. In case work not specifically shown on the drawing or enumerated but it is necessary for the proper completion of the contract, then that will be done by the CONTRACTOR in the same way as if shown in the drawings or enumerated therein. Following are the major activities in Contractor's scope.
- 3.2.7. Unload COMPANY furnished equipment and materials. Load and transport equipment and materials from the storage area to the installation location.
- 3.2.8. For process equipment erection necessary instruction as provided by manufacturer Site Construction manager shall be followed.
- 3.2.9. Crane capacity shall be checked & certified for its suitability for the equipment lift. Valid test certificates of the lifting equipment are to be produced before starting the work and are to be submitted to the Site in charge for verification and approval.
- 3.2.10. Equipment placement on foundation and anchor bolts size & projection shall be checked prior to placement.
- 3.2.11. In case any hot work is required to carry out at site due to any mismatch, necessary corrective action like NDT or hydro testing shall be carried out by contractor.
- 3.2.12. Install all the equipment shown on the drawings or as noted in other contract documents.
- 3.2.13. Equipment installation shall include the supply and placement of grout for equipment or materials and the supply and installation of anchors and fasteners as required for a complete installation.
- 3.2.14. Inspection of the location for the equipment to ensure readiness of area including anchor bolt locations, size, projections, and placement of support steel where applicable.
- 3.2.15. All materials and equipment furnished by the CONTRACTOR shall be in accordance with the specifications. For substitution of any materials deviating from the specification's approval shall be taken from COMPANY. A description of CONTRACTOR supplied substituted material shall be submitted to the COMPANY Construction Manager for approval.
- 3.2.16. The CONTRACTOR shall be responsible for all obligations under ESI act and any other acts and regulations that may be relevant in carrying out the work assigned to him.
- 3.2.17. The CONTRACTOR shall not sublet or subcontract the work or part of the work to any other party without the prior consent of the COMPANY.
- 3.2.18. All equipment handed over to the CONTRACTOR for erection are to be inspected thoroughly by the CONTRACTOR for any damages which might have occurred during transportation / handling and if damages are observed, the same is to be informed to the Site in-charge immediately.
- 3.2.19. The equipment's handed over to the CONTRACTOR for erection is to be handled carefully. The CONTRACTOR should use the correct tools and correct practices in



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handling and installation of the equipment's. The CONTRACTOR will be responsible for any damages to the equipment during erection of the equipment's. The cost of repair/replacement of the equipment, if required, along with the liquidated damages for the delay in the work due to damages during erection will be in the CONTRACTOR's account.

- 3.2.20. Surface preparation of foundation surface to remove the excessive irregularities is part of CONTRACTOR'S scope.
- 3.2.21. If there is error in the drilling of holes in the equipment base plate or there is error in the positioning of the foundation bolts or pockets, the same is to be rectified by the CONTRACTOR without any additional cost.
- 3.2.22. The instruction manual given by the any equipment or package supplier should be read before starting the erection. Any special instruction given shall be strictly followed.
- 3.2.23. Consumables like welding rods, cutting wheel, grinding wheel, cutting gas etc. are to be brought by the CONTRACTOR.
- 3.2.24. After completion of the work, clearance of the site, removal of temporary structures used for erection works, removal of debris etc. are in the CONTRACTOR's scope.

### **3.3. INSTALLATION REQUIREMENTS**



- 3.3.1. The CONTRACTOR shall read and understand the equipment / package manufacturer's installation requirements prior to beginning the installation of the equipment.
- 3.3.2. Equipment shall only be lifted and handled in accordance with the manufacturer's instructions and at points and locations designated for such handling.
- 3.3.3. Before installation, all parts shall be thoroughly cleaned of all rust, grit, and foreign matter. Where accessible without disassembly, all holes and grooves for lubrication shall be examined and cleaned where necessary.
- 3.3.4. Bolts and screws shall be tightened uniformly without over-stressing the threads. Anchor bolts shall be adequately tightened, and all other bolts shall be tightened as per manufacturer's instructions.
- 3.3.5. During installation of equipment, all small access openings shall be covered with temporary covers made of tape, plywood, or sheet metal whenever work is not actually in progress.
- 3.3.6. Clearance around all equipment shall be checked prior to installing the equipment. Any interference or lack of access for maintenance that may be evident shall be reported to the COMPANY Construction Manager.
- 3.3.7. All foundation elevations and bolt locations shall be verified prior to the start of installation of equipment. Bending of bolts to fit equipment base plate holes beyond the limit of the bolt sleeves will not be acceptable.
- 3.3.8. Levelling and alignment of all equipment shall be within the tolerance specified in the manufacturer's instructions. Where equipment is received as a shop-assembled unit, alignment shall be checked and adjusted where necessary.
- 3.3.9. Levelling plates, dowels, shims, and grout are to be furnished by the CONTRACTOR.
- 3.3.10. Field alterations to equipment to facilitate installation shall not be made without written

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approval from COMPANY. Subassemblies shall be dismantled only to the extent necessary to verify clearances, equipment condition and lubrication requirements. Total dismantling of the subassemblies, if necessary, shall be carried out only with the written approval from the COMPANY.

- 3.3.11. The CONTRACTOR shall maintain alignment and lubrication records on all mechanical equipment and submit them to COMPANY for acceptance upon completion of the installation. Such records shall clearly indicate at least the following:
- Equipment name and number
  - Contract number and name
  - CONTRACTOR's name
  - CONTRACTOR's employee name, craft type and employee number.
  - Date and other pertinent details
- 3.3.12. CLEANING, LUBRICATING AND HYDRAULICS
- 3.3.13. All equipment shall be lubricated in accordance with the manufacturer's instructions.
- 3.3.14. Rotating equipment which has been shipped dismantled for assembly in the field, or shipped without lubricants, shall have the bearings cleaned, inspected, and lubricated.
- 3.3.15. All field-assembled lubrication or hydraulic oil supply and return piping shall be cleaned and pressure tested in accordance with the applicable specification or alternate procedure as approved by COMPANY. Factory-assembled lubrication and hydraulic systems do not require flushing unless the manufacturer states otherwise or if contamination is suspected.
- 3.3.16. Grease or other protective coating applied for protection of the equipment in shipping and storage shall be removed using suitable solvents or cleaners which will not damage the finish of the machine.
- 3.3.17. The CONTRACTOR may be responsible to provide all hydraulic oils, lubricating oils, and flushing oils for all mechanical equipment in strict accordance with the manufacturer's recommendation and as advised by COMPANY's construction manager.
- 3.3.18. PRE-COMMISSIONING OF MECHANICAL EQUIPMENT
- 3.3.19. After the basic system and equipment is installed, the following shall be performed and recorded to assure construction completeness:
- 3.3.20. Check installation for conformance with the design and specifications using available data (design drawings, vendor's drawings and manuals, Process, and instrumentation diagrams [P&IDs].)
- 3.3.21. Confirm suitability of mechanical equipment operation by:
- 3.3.22. Checking alignment of all couplings, belts, gears, reducers, and sprockets (complete all records)
- 3.3.23. Perform and record required tests such as visual inspection, pressure and hydrostatic.
- 3.3.24. Check that all moving parts have safety guards and if not, CONTRACTOR shall provide acceptable field guards.





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- 3.3.25. Check cleanliness of equipment and systems.
- 3.3.26. The above shall include all checks and tests which can be performed without energizing systems. All run-in tests shall consist of continuous operation until all bearing temperatures and equipment vibrations reach a steady state condition.
- 3.3.27. The following tests shall be made:
- 3.3.28. Check operation of hydraulic and lubrication systems. Oil supply shall be confirmed.
- 3.3.29. Checks shall be made between all moving parts to be sure there is no interference and that clearances are to the manufacturer's tolerances.
- 3.3.30. Make sure that all instrument devices limit switches, timing devices, overload trips, alignment switches, emergency stop switches and the like, are operating properly.
- 3.3.31. Simulate system operation and make other adjustments as required to ensure satisfactory run-in operation.
- 3.3.32. It will be the CONTRACTOR's responsibility to do touch-up painting on all finished surfaces damaged or abraded during installation or left unpainted for field welding.
- 3.3.33. CONTRACTOR shall prepare the surface by removing all oil, dirt, scale, rust, and damaged paint and shall feather edge breaks in existing paint.
- 3.3.34. CONTRACTOR shall furnish and apply the materials including primer and paint needed to properly restore the damaged surface coating.
- 3.3.35. All piping systems and vessels are to be isolated from contamination at all times, i.e. caps, plugs, covers, etc.
- 3.3.36. All systems shall be fully cleaned, tested, and inspected prior to first filling, flushing or introduction of processed and handled materials.
- 3.3.37. All coordination to package supplier shall be carried out by the COMPANY.
- 3.3.38. All installation readings must be documented and accepted by the package supplier's representatives (where applicable) and COMPANY prior to pre-commissioning.
- 3.3.39. All equipment and instrument calibration if required is to be completed and confirmed in writing to COMPANY prior to pre-commissioning.
- 3.3.40. All equipment is to be certified complete and ready for Start-Up. All parties involved in all disciplines are to sign off on each system prior to commissioning. This includes:
  - COMPANY
  - Package supplier's Representative (if applicable)
  - Installation contractor



### 3.4. AS-BUILT DOCUMENTS

On successful completion of commissioning, the successful bidder shall prepare As Built drawings / reports for all equipment as specified in scope of work. All "As Built" drawings / reports shall be submitted as below.

- Installation procedure of all equipment

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- Alignment report
- Installation, hook-up, field testing and commissioning procedures/ specifications.



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## 4. SCOPE OF WORKS FOR PIPING WORKS

### 4.1. GENERAL

- 4.1.1. The CONTRACTOR shall procure, supply, transport, receive at site, store, fabricate, inspect - NDT, hydrotest, blast, paint, preserve and erect piping spools, valves, inline SP items, instruments, pipe supports and insulation as per P&ID, line list, piping layout and piping isometrics.
- 4.1.2. The scope of supply shall be as per MTO indicated in the SOR attached to this tender.
- 4.1.3. Application of heat tracing and hot insulation shall be the scope of the CONTRACTOR.
- 4.1.4. Minor structural work like fabrication & erection of Primary & secondary support structure; support pedestal is in successful bidder's scope. All materials required for support fabrication and erection shall be supplied by successful bidder.
- 4.1.5. All the drawings, documents, specifications etc. related to the work given by the COMPANY to the CONTRACTOR shall be treated as confidential & shall remain property of the COMPANY. The CONTRACTOR shall not disclose the details of the said documents to anybody or shall not publish any information contained.
- 4.1.6. CONTRACTOR is hereby advised to visit the site at their cost prior to submission of bid and apprise himself of existing site condition.
- 4.1.7. No changes to any drawing / design details supplied by the COMPANY to CONTRACTOR will be acceptable. If for any technical reason a change is warranted then such change shall be furnished by CONTRACTOR to COMPANY along with a formal Change Request, with a detailed explanation for approval. Such changes shall be deemed as a part of the scope of work of the CONTRACTOR and will have no additional cost and time implication. However, in any specific case if agreed with COMPANY any change which result in cost saving, it shall be passed on to COMPANY.
- 4.1.8. Covered storage and air-conditioned storage, if required at site, will be in the scope of the CONTRACTOR. He will submit the details of such items with size & space required along with the bid. In case the COMPANY is not able to provide space for construction of such storage then CONTRACTOR must arrange suitable space nearby the site by his own.
- 4.1.9. CONTRACTOR will have to carry out inspection activities of equipment/materials through an Owner approved third party inspection agency when they receive Material / Equipment from COMPANY before start of work. It is the responsibility of the CONTRACTOR for inspection / testing as per specifications approved documents and test plans. Incase receiving of any defective/damage material, it is CONTRACTOR's responsibility to bring it in the notice of COMPANY for replacement / repair of the item.
- 4.1.10. All the piping items like pipe, fittings, valve, flanges, gasket, stud bolt, structural materials are under CONTRACTOR's scope of supply as per bill of material identified in the SOR/MTO.
- 4.1.11. Skilled, semi-skilled labor's & their supervision, arrangement for boarding and lodging, tools, tackles, cranes for heavy lifts, chain pulley blocks, Welding machine, consumables like electrodes and accessories for the fabrication, construction, installation, mechanical completion, inspection, testing and commissioning of the work





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shall be CONTRACTOR's responsibility.



- 4.1.12. Receiving piping materials from stores, inspection, transportation from stores to local fabrication yard, end preparation, prefabrication of spool piece as per drawing supplied by owner, testing, transport to erection site, on site fabrication, assembly and erection including installation of supports and structures, supply of testing spools and supports, testing of pipeline after erection, Flushing and cleaning of pipe lines, temporary support during hydro test, painting in shop/site, arrange water for hydro testing and dispose of water used for hydro testing as per instruction of COMPANY.
- 4.1.13. The piping erection work shall include installation of valves, on-line instrument items like control valves, flow meters etc. and other piping attachments as indicated in drawing. CONTRACTOR will ensure that pipeline is fully aligned with equipment nozzles before bolting.
- 4.1.14. The CONTRACTOR will ensure that all materials should be properly handled with care without any damage. In case of any damage found during transportation or loading & unloading, the CONTRACTOR shall repair or replace the material at his own cost. CONTRACTOR must get approval from COMPANY before using such material.
- 4.1.15. Total inventory will be maintained by CONTRACTOR for material used at site work.
- 4.1.16. The parts stored shall be classified by category according to their characteristics (diameter, thickness, grade of steel). These operations must be finished by the date of "Completion of the Work".
- 4.1.17. This description of scope of work intends to give idea of quantum of job involved, however it is not exhaustive, and any additional work required to be done by the CONTRACTOR as per details given in drawing & documents shall be performed by CONTRACTOR without any extra claim.
- 4.1.18. The requirement stipulated in the Bid Document is the minimum requirement for the project. Any item that was not covered in the document but required, as per assessment of the bidder, for fulfilling the performance of the system CONTRACTOR may indicate the same with techno- economic justification for owner consideration along with BID.

**Scope of work includes the following but not limited to the same;**

- Pipes (All sizes and schedule as per the drawings/documents)
- Flanges (All sizes, types & ratings as per documents / drawings).
- Fittings (All sizes, types and schedule as per documents / drawings)
- Valves (All sizes, types and ratings as per documents/ drawings)
- Strainer (All sizes, types and rating as per documents/drawings)
- Gaskets including insulating kits (All sizes, types & Ratings as per documents /drawing)
- Bolts, Nuts or M/C Bolts (All types as per specification)
- Expansion Joint / Bellows (All types as per specification)
- Specialty items like online filters, ejectors, sample coolers, steam traps, strainers, and air traps etc.
- Online instruments like control valve, orifice flange, rotameter, safety valves etc. (If applicable and identified under E&I SOR/MTO)



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- Fabrication and erection of pipe supports like shoe, saddle, guide, stops, anchors, clips, cradles, hangers, turn buckles, supporting fixtures, bracket cantilevers, struts, tee posts including erection of spring supports and sway braces.
- Fabrication of other misc. items
- Fabrication of piping specials like special radius bends, reducers, miters etc.
- Fabrication of plain and threaded nipples from pipes as required during erection.
- Fabrication of swage nipples as and when required.
- Fabrication of odd angle elbow like 60°, 30° or any other angle from 90/45° elbows as and when required.
- Fabrication of flange, reducing flange, blind flange, spectacle blinds as and when required.
- Fabrication of stub-in connection with or without reinforcement.
- Grinding of edges of pipes, fittings, flanges etc. to match mating edges of uneven / different thickness wherever required.
- Modifications like providing additional cleats, extension of stem of valve, locking arrangement of valves etc. as and when required.
- Obtaining approval for drawings prepared by contractor from statutory authority. All statutory fees to concerned government office such as PESO shall be paid by the CONTRACTOR. Contractor to do the liaison work and consider all expenses for the same in his scope. COMPANY shall not pay anything other than statutory fee.
- Radiography, stress relieving, dye penetration, magnetic particle test etc. as required in specification.
- Making material reconciliation statement and return of Owner's supply left over materials to Owner's storage.
- Flushing and testing of all piping systems as per standard specification for inspection, flushing and testing of piping systems.
- CONTRACTOR will have to arrange water for construction activities at site (fabrication, testing and commissioning etc.). COMPANY is not liable to provide water from its source. However, it is the discretion of the COMPANY to provide these facilities to the CONTRACTOR on a chargeable basis.
- All the tools & tackles required for the work are to be brought by the CONTRACTOR.
- Carry out insulation and painting as per Painting and Insulation procedure mentioned in respective specifications. The supply of insulation and painting will be at the discretion of the COMPANY, so the CONTRACTOR should quote his price for Insulation & painting, with and without supply of Insulation & painting material.
- Depending upon the severity of application, the extent of NDE shall be decided. As a rule, all hydrogen, oxygen, NACE, and any other lethal service shall have 100% radiography on Butt weld joints in all class ratings.
- In 100% radiography class any fillet welds employed shall have 100% DP/MP test in CS/AS classes and 100% DP test in SS classes. Cat. 'D' service as per ASME B31.3 does not require radiography.
- Butt welds for class in 150# for normal hydrocarbon / hazardous service shall be

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subjected to 10% radiography and fillet welds to 10% DP/MP test for CS/AS and 10% DP test for SS.

- CONTRACTOR must provide equivalent length spool piece to inline instrument if inline Instrument is not available during construction stage.
- CONTRACTOR must provide all testing apparatus, appurtenances and fittings and special testing fluids wherever required.
- Wrapping of PTFE tape on threaded joint before assembly for leak proof joint
- CONTRACTOR will do Flushing of pipeline, air drying, disposal of fluids, reinstatement, preservation of piping and miscellaneous items following hydro test. Hydro test of the pipeline to be performed before painting /insulation activity. During hydro test, if some leakage is traced out on the joint of pipeline, then the joint should be repaired by cutting & re-welding by CONTRACTOR. Same line should hydro tested again.
- Mechanical / chemical cleaning of pipeline before painting / insulation should be done as per specifications. Hydro test of the pipeline (non-IBR) to be performed at a pressure of 1.5 x design pressure. However, if the design pressure of inline items (Valve/Instruments etc.) < than pipe design pressure, then it should be tested at reduced pressure. (Ref. Guideline of B31.3)
- CONTRACTOR must Supply of all additional piping materials required for hydro testing and pre-commissioning e.g., piping spools, bolting and gaskets, flanges, blinds etc.
- CONTRACTOR must carry out fabrication and installation, setting and commissioning of pipe supports, guides, anchors and spring supports as required. In case of pipe supports fouling or clashing, their new locations will be finalized by the CONTRACTOR at site with COMPANY's approval.
- CONTRACTOR will be responsible to resolve problems arising during prefabrication, shop fabrication, field fabrication or erection at site & based on sub vendor data. Necessary field changes in the drawing will be made by the CONTRACTOR and submitted to COMPANY for review & will be reflected in the As Built Drawings, Documents.
- CONTRACTOR will provide all industrial gases such as oxygen, acetylene, inert gases, all types of electrodes, filler wire, flux wire, brushes, etc.
- CONTRACTOR will provide all materials such as hydraulic pumps, metallic blinds, temporary gaskets etc. and arrangement required for pressure testing.
- CONTRACTOR will provide all materials, consumables, tools & tackles required for cutting, fitting, welding, brazing, cleaning, grinding, threading, and other dismantling.
- CONTRACTOR will take extra care for mating flange and will be exercised to properly align the pipe and to check the flanges for trueness, so that faces of flange can be pulled together with ease, without inducing any stress in the pipes and equipment nozzle. Extra care will be taken for flange connection to Pump, Compressor etc. The flange connection to this equipment will be checked for misalignment, excessive gap etc. after the final alignment of the equipment is over. The joint will be made at the discretion of the COMPANY.
- Supply & erection of Anchor bolts for pump are not in piping erection CONTRACTOR's scope.
- CONTRACTOR will provide earthing lug connection to piping item if required as per drawing.

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## 4.2. ERECTION

### 4.2.1. CLEANING OF PIPING BEFORE ERECTION

Before erection all prefabricated spool pieces, pipes, fittings etc. shall be cleaned inside and outside by suitable means. The cleaning process shall include removal of all foreign matter such as scales, sand, weld spatter chips etc. by wire brushes, cleaning tools etc. and blowing with compressed air/or flushing out with water. Special cleaning requirements for some services, if any shall be as specified in the piping material specification or isometric or line list.

S.S jacketed piping requiring pickling shall be pickled to remove oxidation and discoloring due to welding.

### 4.2.2. PIPING ROUTING

No deviations from the piping route indicated in drawings shall be permitted without the consent of Site in-Charge of COMPANY. Pipe to pipe, pipe to structure / equipment's distances / clearances as shown in the drawings shall be strictly followed as these clearances may be required for the free expansion of piping /equipment.

No deviations from these clearances shall be permissible without the approval of Site in-Charge. In case of fouling a line with other piping, structure, equipment etc. the matter shall be brought to the notice of Site in- Charge and corrective action shall be taken as per his instructions.

### 4.2.3. SLOPE

Slopes specified for various lines in the drawings / P&ID shall be maintained by the Contractor. Corrective action shall be taken by the Contractor in consultation with Site in-Charge wherever the Contractor is not able to maintain the specified slope.

### 4.2.4. EXPANSION JOINTS / BELLOWS

Installation of Expansion Joints/Bellows shall be as follows:

All Expansion joints / Bellows shall be installed in accordance with the specification and installation drawings, supplied to the Contractor.

Upon receipt, the Contractor shall remove the Expansion Joints/ Bellows from the case(s) and check for any damage occurred during transit.



The Contractor shall bring to the notice of the Site-in-Charge any damage done to the bellows / corrugations, hinges, tie-rods, flanges / weld ends etc.

Each Expansion Joint / Bellow shall be blown free of dust / foreign matter with compressed air or cleaned with a piece of cloth.

For handling and installation of Expansion Joints, great care shall be taken while aligning. An Expansion Joints shall never be slanged from bellows corrugations / external shrouds, tie / rods, angles.

An Expansion Joints / Bellow shall preferably be slanged from the end pipes / flanges or on the middle pipe.

All Expansion Joints shall be delivered to the Contractor at "Installation length", maintained by means of shipping rods, angles welded to the flanges or weld ends or by

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wooden or metallic stops.

Expansion Joints stop blocks shall be carefully removed after hydrostatic testing. Angles welded to the flanges or weld ends shall be trimmed by saw as per manufacturer's instructions and the flanges or weld ends shall be ground smooth.

The pipe ends in which the Expansion Joint is to be installed shall be perfectly aligned or shall have specified lateral deflection as noted on the relevant drawings.

The pipe ends / flanges shall be spaced at a distance specified in the drawings.

The Expansion Joint shall be placed between the mating pipe ends / flanges and shall be tack welded/bolted. The mating pipes shall again be checked for correct alignment.

Butt-welding shall be carried out at each end of the expansion joint. For flanged Expansion Joint, the mating flanges shall be bolted.

After the Expansion Joint is installed, the Contractor shall ensure that the mating pipes and Expansion Joints are in correct alignment and that the pipes are well supported and guided.

The Expansion Joint shall not have any lateral deflection. The Contractor shall maintain parallelism of restraining rings or bellows convolutions.

For carrying out welding, earthing lead shall not be attached with the Expansion Joint.

The Expansion bellow shall be protected from arc weld spot and welding spatter.

Hydrostatic Testing of the system having Expansion Joint shall be performed with shipping lugs in position. These lugs shall be removed after testing and certification is over.

#### **4.2.5. FLANGE CONNECTIONS**

While fitting up mating flanges, care shall be exercised to properly align the pipes and to check the flanges for trueness, so that faces of the flanges can be pulled together, without inducing any stresses in the pipes and the equipment nozzles. Extra care shall be taken of flange connections to pumps, turbines, compressors, cold boxes, air coolers etc.

The flange connections to these equipment's shall be checked for misalignment, excessive gap etc. after the final alignment of the equipment is over. The joint shall be made up after obtaining approval of Site-in-Charge.



Temporary protective covers shall be retained on all flange connections of pumps, turbines, compressors, and other similar equipment, until the piping is finally connected, to avoid any foreign material from entering this equipment. The assembly of a flange joint shall be done in such a way that the gasket between these flange faces is uniformly compressed.

To achieve this bolt shall be tightened in a proper sequence. All bolts shall extend completely through their nuts but not more than 1/4". Steel to C.I. flange joints shall be made up with extreme care, tightening the bolts uniformly after bringing flange flush with gaskets with accurate pattern and lateral alignment.

#### **4.2.6. VENTS AND DRAINS**

High point vents and low point drains shall be provided as per the instructions of Site in-



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Charge of company, even if these are not shown in the drawings. The details of vents and drains shall be as per piping material specifications / job standards.

#### **4.2.7. VALVE**

Valves shall be installed with spindle / actuator orientation / position as shown in the layout drawings. In case of any difficulty in doing this or if the spindle orientation / position is not shown in the drawings, the Site-in-Charge of the company shall be consulted, and work done as per his instructions. Care shall be exercised to ensure that globe valves, check valves, and other unidirectional valves are installed with the "Flow direction arrow" on the valve body pointing in the correct direction. If the direction of the arrow is not marked on such valves, this shall be done in the presence of Site-in-Charge before installation. Fabrication of stem extensions, locking arrangements and interlocking arrangements of valves (if called for), shall be carried out as per drawings / instructions of Site-in-Charge.

#### **4.2.8. INSTRUMENTS**

Installation of in-line instruments such as restriction orifices, control valves, safety valves, relief valves, rotameter, orifice flange assembly, venturi meter, flow meters etc. shall form a part of piping erection work. Fabrication and erection of piping up to first block valve / nozzle / flange for installation of offline Instruments for measurement of level, pressure, temperature, flow etc. shall also form part of piping construction work.

The limits of piping and instrumentation work will be shown in drawings / standards / specifications. Orientations / locations of take-offs for temperature, pressure, flow, level connections etc. shown in drawings shall be maintained.

Flushing and testing of piping systems which include instruments mentioned above and the precautions to be taken are covered in flushing, testing and inspection of piping. Care shall be exercised, and adequate precautions taken to avoid damage and entry foreign matter into instruments during transportation, installation, testing etc.

#### **4.2.9. LINE MOUNTED EQUIPMENT'S/ITEMS**



Installation of line mounted items like filters, strainers, steam traps, air traps, Desuperheater, ejectors, samples coolers, mixers, flame arrestors, sight glasses etc. including their supporting arrangements shall form part of piping erection work.

#### **4.2.10. MITER BENDS AND FABRICATED REDUCERS**

The specific application of welded miter bends and fabrication reducers shall be governed by the Piping Material Specifications. Generally, all 90 deg. miters shall be 4-piece 3-weld type and 45 deg. miters shall be 3-piece 2-weld type. The radiographic requirements shall be as per Material Specifications for process and utility systems and NDT Specification.

#### **4.2.11. GALVANISED PIPING**

Galvanized carbon steel piping shall be completely cold worked, so as not to damage galvanized surfaces. This piping involves only threaded joints and additional external threading on pipes may be required to be done as per requirement.

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#### 4.2.12. PIPE SUPPORTS

- Pipe supports are designed and located to effectively sustain the weight and thermal effects of the piping system and to prevent its vibrations. Location and design pipe supports will be shown in drawing for lines 2" NB. However, any extra supports desired by Site-in-Charge of company shall also be installed.
- No pipe shoe / cradle shall be offset unless specifically shown in the drawings.
- Hanger rods shall be installed inclined in a direction opposite to the direction in which the pipe moves during expansion.
- Present pins of all spring supports shall be removed only after hydrostatic testing and insulation is over. Springs shall be checked for the range of movement and adjusted if necessary to obtain the correct positioning in cold conditions. These shall be subsequently adjusted to a hot setting in operating condition. The following points shall be checked after installation, with the Site-in-Charge and necessary confirmation in writing obtained certifying that:
  - All restraints have been installed correctly.
  - Clearances have been maintained as per support drawings.
  - Insulation does not restrict thermal expansion.
  - All temporary tack welds provided during erection have been fully removed.
  - All welded supports have been fully welded.

#### 4.2.13. DRAWING AND DOCUMENT

Drawing and document, which cover the piping construction work, shall be issued by Company in accordance with "Drawing and Document List".

Piping work shall be carried out with Company issued "Final" drawing and document unless otherwise specified.



### 4.3. FABRICATION

#### 4.3.1. GENERAL

- Fabrication requirement shall be in accordance with ASME B 31.3 unless otherwise specified.
- Fabrication shall be executed in accordance with the drawings, documents, and the related Engineering Specifications. Stainless steel pre-fabrication work including material storing shall be well separated from other steel pre-fabrication works.
- Tools and equipment to be used shall be suitable for stainless steel and shall not be used on any other materials, or vice versa.
- The bolt holes of flanges shall be straddle /off center from a vertical center line in a horizontal pipeline, and from plant north on a vertical pipeline unless otherwise indicated in the drawing.

#### 4.3.2. CUTTING

- The cutting line shall be marked on pipe. Where the material marking will become invisible after cutting, additional material marking shall be provided.

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- In the case of gas cutting, cutting surface shall be ground off to remove any edge and roughness and be made flush and smooth so as not to harm welding quality. In the case of automatic or semi-automatic gas cutter, the cut edge may be beveled without grinding off.
- In the case of gas cutting, cutting slag stuck inside pipe shall be completely removed, especially for boring of pipe for weld branch.
- Abrasive disc used for cutting or grinding of austenitic stainless steels or other high Cr-Ni steel shall not be used for carbon steels, or vice versa.
- Plasma jet cutting may be applied for cutting stainless steel materials.

#### **4.3.3. END PREPARATION**

- End preparation for butt weld or any other details which meets the WPS.

#### **4.3.4. WELDING BEVELS FOR BUTT WELDS**

- The shape of the beveling shall be in accordance with the WPS approved by the Company.
- All weld bevels and weld surfaces shall be free from cracks, porosity, slag inclusion and other defects indicative of poor manufacture.



#### **4.3.5. ALIGNMENT AND TRIMMING**

- In the case of butt-welding pipe and / or fitting having unequal wall thickness, of which the difference is more than 3 mm in outer surface and / or 1.5 mm in inner surface, the end of the thicker pipe shall be trimmed by grinding. The gradient of this trimming shall be less than 30° between worked and no worked parts shown below.
- Branch connections which are about the outside surface of the run pipe shall be contoured for groove welds which meet the WPS requirements.
- Branch connections which are inserted through a run opening shall be inserted at least as far as the inside surface of the run pipe at all points.
- When a pipe having a longitudinal weld seam is used in a horizontal line, the pipe shall be laid so that the longitudinal weld seam is not on bottom or top of the pipe.
- Each butt, socket and support joints shall bear an identification number, which shall be maintained in the piping sketch/ drawing. These numbers shall appear on the fit up/ weld visual reports and NDT records.

#### **4.3.6. WELDING PROCEDURE**

- The pipe shall be aligned so that the longitudinal mill weld in the pipe is on the top 90 Degree of the pipeline (except on vertical bends) and in such a way that the longitudinal mill welds are staggered not less than 45 degrees.
- Welding surfaces shall be thoroughly cleaned to be dry and free from paint, oil, rust, scale, and other materials detrimental to welding quality. Each bead shall be cleaned of scale, oxides, dirt, slag, and other impurities before any succeeding weld passes are made.
- CONTRACTOR is responsible for submitting the welding procedure specification (WPS) required for the project.



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- The welders shall be qualified on the approved WPS and job material.
- The test pieces of WPS shall be retained for verification.

#### **4.3.7. DEFECTS:**



- Defects revealed by visual inspection, D.P. Test & Radiographic inspection of welds shall be repaired / rectified by the Contractor at his cost to the satisfaction of the Site Engineer. The repaired portion shall be re-examined by radiography. The repairs carried out shall meet the approval of the Site Engineer

#### **4.3.8. WELDING RODS AND ELECTRODES:**

- The electrodes shall be stored properly by the contractor to prevent moisture absorption and shall be handled in such a manner as to avoid damage to the coating. The manufacturer's instructions in this connection shall be strictly followed.
- All low Hydrogen type electrodes shall be completely dry when used. These shall be pre-dried in suitable ovens at controlled temperature of 200 - 250 Degree Celsius for not less than four hours and then used on the job.
- Electrodes, wire, and flux, when used shall be free of rust, oil, grease, earth, or any other matter, which could be harmful for the quality of welding.
- Electrodes of reputed makes shall only be used.
- The welding consumables used shall meet the requirements of the relevant codes and shall produce a deposit which is compatible in chemical analysis and similar in mechanical properties to the parent material.
- Only consumables which have received the prior approval of Engineer- in-charge shall be used.
- Before proceeding with welding, Contractor shall submit for approval to site Engineer, Type, brand, and size for each batch of consumables for use in each class of piping.
- Different grades of electrodes shall be completely separated. The Contractor shall have facilities available for storing and testing electrodes at recommended temperature where specified. The consumables shall be stored and always handled during construction to avoid damage to them and to the containers in which they are transported. Those in open in open containers shall be protected from excessive moisture changes.
- Electrodes, filler wires and fluxes that show signs of damage or deterioration shall not be used.

#### **4.3.9. INSPECTION OF PREFABRICATED PIPING**

- Pipe work that has been done shall be checked with the relevant Drawings and other related documents to verify that it, as fabricated, complies with dimensions and specifications.
- Fabrication shall have dimensions falling within the tolerances defined earlier.
- All welds shall be visually examined and shall also be subjected to radiographic inspection as required.

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- Contractor shall provide tools / instruments like spirit levels, dumpy levels, scale, tapes, gauges, calipers etc. for taking levels & measurements whenever required by Site-in charge.

#### **4.3.10. MARKING**

- All piping components for which welding has been completed shall bear the paint marking with the joint number and identification number of the welder. Spool piece No. shall be clearly marked on fabricated components.
- Each joint shall uniquely identified and the weld mark shall be marked be identified in the fabrication isometrics.

#### **4.3.11. STORING**

- Inside of fabricated components shall be cleaned by air blowing, then opening of fabricated components shall be covered with suitable materials so as not to enter the foreign matters such as sand, mud, etc. into piping components.
- The gasket surface of flange, thread, and welding bevel shall be protected from any damage due to cleaning work and handling of storing.
- Zinc contamination to stainless and high Ni-Cr steel shall be avoided. Countermeasures shall be taken to the materials such as protection from Zinc adhesion by paint spray work, separation from Zinc contact when the material is laid on the galvanized grating floor, etc.

#### **4.3.12. PRE-COMMISSIONING, COMMISSIONING AND POST-COMMISSIONING**

- CONTRACTOR will be responsible for the effective working of all piping items like valves and other fittings prior to commissioning. In case any problem is seen in proper functioning of piping system, CONTRACTOR will be responsible to rectify the problem. In case, if some modification work is needed during commissioning, the contractor must carry out the job without any extra charges.

#### **4.3.13. AS BUILT DOCUMENTS**

On successful completion of hydrostatic testing, the Contractor shall prepare “As Built” drawings / reports for entire piping system as specified in scope of work.

- All “As Built” Drawings / reports shall be submitted as below.
- Piping General Arrangement drawings for all terminals.
- Piping isometrics
- Inspection and test reports
- Piping and equipment support details








**CONSTRUCTION CONTRACTOR SCOPE  
FOR ELECTRICAL WORKS**



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**CONSTRUCTION CONTRACTOR  
SCOPE FOR ELECTRICAL WORKS  
Document No: BHII-CPF-ELE-REP-5021**

					
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## 1.0 INTRODUCTION

Sun Petrochemicals Private Limited (Sun Petro) plans to enhance the capacity of the CPF at Bhaskar onshore field at Anand district of Gujarat, on EPC-M basis. Sun Petro plans to connect more wells to the existing CPF. Based on the CPF gap analysis study done by Global Maritime Consultants Group (GMCG) and as per Client preference it is concluded that the existing facility with minimum modifications, can help enhance production from current 7000 BOPD to 12000 BOPD. All documents are to be updated accordingly for all the engineering and delivery requirements.

GMCG Maritime Consultants Pvt Ltd has been contracted by Sun Petrochemicals Private Limited to execute relevant engineering and associated modifications in the onshore central processing facility (CPF).

## 2.0 PROJECT DETAILS

### 2.1 GENERAL

- Client : SUN PETROCHEMICALS PVT LTD., KHAMBHAT
- Consultant : GMCG Pvt Ltd.
- Project Title : Central Processing Facility Augmentation (12000BOPD)
- Project Location : Khambhat, Gujarat, India

### 2.2 ELECTRICAL POWER DETAILS

- Voltage : 11KV / 415V
- Phase : 3 Phase
- Frequency : 50 Hz.

### 2.3 MEASUREMENT & CALIBRATION UNITS



Unless otherwise specified, electrical and control systems shall be measured & recorded in MKS units only.

### 2.4 TYPE OF TENDER

This is an ITEM RATE tender and Contractors / Bidders are requested to submit quotations as per the BOQ. Compliance to Specifications is required by the Consultant.

## 3.0 CONSTRUCTION SCOPE OF WORK

This is an item rate construction contract for various types of electrical equipment, cables, lighting & earthing material. Scope includes Supply (as applicable), Erection & Commissioning of Electrical System. The successful bidder shall be provided with relevant drawings & documents.

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## A. SPECIFICATION FOR ELECTRICAL EQUIPMENT INSTALLATION

### 1.0 SCOPE

This specification defines the requirements for the supply, installation, field inspection, testing and commissioning of electrical equipment, forming part of electrical power distribution and utilisation system.

### 2.0 CODES & STANDARDS

2.1 The work shall be carried out in the best workmanlike manner in conformity with this specification, Installation Standards, layout drawings and to the following specifications/ codes of practice of Bureau of Indian Standards.

SP-30 (BIS)	National Electrical Code.
IS: 7816	Guide for testing Insulation resistance of rotating machines.
IS: 10028 (Part-2)	Code of practice for selection, Installation and maintenance of transformers; Part 2: Installation.
IS: 10118 (Part-3)	Code of practice for selection, installation and maintenance of switchgear and control gear; Part 3: Installation.



2.2 In addition to the above it shall be ensured that the installation conforms to the requirements of the following as applicable:

- Indian Electricity Act and Rules.
- Regulations laid down by CEA/Electrical Inspectorate.
- My other regulations laid down by central/state/local authorities and Insurance agencies.

### 3.1 INSTALLATION OF EQUIPMENT

Prior to start of installation of the electrical equipment, Contactor shall verify that equipment and complete materials have been received. Handling, shifting to required site location, installation, testing and commissioning of all electrical equipment shall be done by contractor with utmost care. Manufacturer's instructions and the requirements given in their technical manuals shall be strictly adhered. The substation/switchgear room wherein the equipment shall be installed shall be kept clean, dry and free from all debris. When handling the switchboard panels, care shall be taken to observe the correct lifting arrangements and to make sure that slings are attached to the manufacturer's designated lifting points. No parts shall be subjected to undue strains or sudden stresses which could cause damage to the equipment.

Contractor shall check and report to the Engineer-in-charge about any damaged item and / or missing component for getting the same replaced as per specifications. During installation,

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all accessories and loose items shall also be inspected by the contractor before their assembly/mounting.

### 3.2 SWITCHBOARDS & BUS DUCTS

- 3.2.1 The switchboard panels shall be handled with care, avoiding any impact to the equipment. Dragging of the panels directly on floor shall be avoided. Roller bars may be used for shifting of panels. Use of a crane and trailer shall be made for handling of equipment. The switchboard panels shall be properly supported on the truck or trailer by means of ropes to avoid any chance of tilting. The switchboards shall be lifted after ensuring that panel supports, nuts and bolts are all intact and tightened. While lifting the panels in packed conditions, utmost care shall be taken to avoid any damage to insulators, bushings, metering and protective equipment.

The panels shall be preferably kept inside the packing cases till foundations are ready. Proper rain/sun/dust protection shall be ensured till switchboards are installed.

- 3.2.2 Steel base channels shall be welded to inserts provided in floor slab. Cross members shall be provided at the junctions of each shipping section and other places as required. It shall be ensured that the base plate level of HV switchboard shall match with the finished floor level.

Proper level of base frames shall be maintained throughout and shall be checked with water level/spirit level, Steel Shims shall be provided below base frame wherever required.



- 3.2.3 The switchboard panels shall be taken out from the packed cases and shifted one by one to its proper place. All the panels shall be assembled, aligned and levelled. Alignment of panels shall be checked in both longitudinal and lateral directions. It shall be ensured that panel to panel coupling bolts, bus bar links etc. fit properly without any strain on any part. No new holes for jointing of the panels other than those recommended by the vendor shall be drilled. No gaps shall be left between the panels. Gap if any found between panels shall be suitably sealed using sealing compound or T-profile. The lifting, racking in and out operation of the breaker and all other motions shall be free from any obstruction.

The panels shall be checked for correct vertical position using Plumb line and spirit levels. The switchboard panels shall be tack welded at suitable intervals at base channel.

After erection of switchboard panels, all uncovered portions of floor cut-outs shall be covered with 6 mm thick removable chequered plates finished with floor level. The design of the chequered plates shall be such that the maximum allowable deflection is  $L/200$  (where L is the span of the chequered plates in meters) for a live load of 500 kg. /sq. meters.

The chequered plates shall be painted with a coat of red oxide zinc chromate primer after proper surface preparation as per specifications. Where specified, panels' cut-outs provided for future use shall be filled with lean concrete.



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- 3.2.4 After completion of Installation of switchboards, all the cubicles, switchboard components such as switches, starters, CT and PT chambers, bus bar chamber shall be cleaned and checked for tightness of all the components.

Vacuum circuit breakers shall be checked for integrity of bottle seals. All loosely supplied items shall be fitted up. Bus bar sections or links shall be inserted and where specified, of high voltage equipment shall be insulated. Interconnection wiring between shipping sections shall be made by contractor.

All the wiring connections shall also be checked. Contact resistance of all bus bar joints and contactors shall be checked. Insulator shall be checked for any damage. All the starters, switches, contacts shall be cleaned with CTC where required.



All the moving parts shall be checked for easy and free movement. Hinges of panel doors shall be lubricated to give free and noise free movement. All openings shall be kept completely closed to avoid ingress of any foreign particles inside the panel.

Functional scheme verification of individual feeder shall be carried out and minor wiring modifications in the panel wiring, if required shall be done as per the directions of Engineer in-charge. Special attention shall be paid to CT circuits' polarity, wiring continuity and correctness in the protection as well as measurement circuits. Auto transfer scheme shall be simulated and verified. During the course of scheme verification tests, defective components if any shall be taken out, after bringing to the notice of Engineer-in-charge. The same shall be replaced by component supplied by SUN PETRO.

- 3.2.5 Where switchboard is damp or having a low IR value due to damaged insulators/ bushings/any other insulated parts, or any other reason, the entire switchboard shall be dried- up according to the instruction of the Engineer-in-charge for the IR value to improve to a safe level for commissioning. Care shall be taken to protect the surrounding insulation from direct local heating during the drying up process.
- 3.2.6 All the metering instruments, protective relays and other relays and contactors shall be tested as per manufacturer's recommendations and according to the instructions of the Engineer-in-charge. Protection relays shall be inserted and connected and settings adjusted as required by the Engineer-in-charge.
- 3.2.7 All moving parts, of closing/tripping mechanism, racking in and racking out mechanism, spouts and shutter closing mechanism shall be checked for proper operation. All the auxiliary contacts of breaker shall be checked-up, cleaned and contact pressure measured.
- 3.2.8 All the control wiring, PTs, bushings, bus bars, other live parts of switchgear, incoming and outgoing cables shall be meggered.

3.1.9 Electrical simulation tests shall be carried out for all the protective, alarm and annunciation relays



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and external interfaces to ascertain proper functioning.

3.1.10 Safety insulation mats of approved make and of required voltage grade shall be provided in the sub-station.



### 3.1.11 Pre-Commissioning Check List for Switchboards:

Before commissioning any switchboard, following points shall be checked and ensured for safe energising of the switchboard:

- i That the installation of equipment to be commissioned is complete in all respects with its auxiliaries and all other mounting including earthing. Openings in floor within and outside panels have been sealed off. All cover and door gaskets are intact to make the enclosure vermin proof.
- ii That all the metering instruments have been checked and found in working order. Indicating lamps are healthy and are in correct position. All power and control fuses are of proper rating.
- iii That the polarity test and ratio test of all the PTs and CTs is complete and phase sequence of CTs conforms to the correct vector group connections. Wiring continuity and correctness are ensured in the protection and measurement circuits. Polarity of DC power supply for all the circuits is correct.
- iv That the high voltage tests of incoming and outgoing cables have been conducted and results are satisfactory.
- v That all the protective relays including both conventional and microprocessor based numerical relays and thermal overload relays have been tested for secondary injection tests. Relay settings, status indications, fault annunciations shall be recorded for future reference.
- vi That IR Value has been recorded for bus bars, circuit breaker, incoming and outgoing cables, control wiring and potential transformers. Where required joint resistance of bus bars have been recorded and found to be satisfactory. All the surroundings and panels have been cleaned and temporary earth leads have been removed.
- vii Following tests shall be ensured for all CTs
  - Insulation resistance test
  - Ratio test through primary injection
  - Polarity test
  - Knee point voltage for class PS CTs
- viii Following tests shall be ensured for all PTs

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- Insulation resistance test
  - Ratio test through primary injection
  - Polarity test
- ix. Following tests shall be ensured for all breakers
- Insulation resistance test
  - Breaker closing, opening sequence using 3 pole timers
  - High voltage test both in open and close condition for HV breaker Contact resistance of all three poles using 100A DC Kit
- x Following tests shall be ensured for all meters
- Calibration of meters
  - Functional verification and settings
- xi Following tests shall be ensured for all relays
- Secondary injection test
  - Relay settings
  - Timing check with timers
  - Any other test recommend by the supplier
- xii. Following tests shall be ensured for all bus bars
- Tightness of all nuts/bolts using Torque wrench
  - ER value
  - Contact resistance using 100A DC Kit
  - Cleaning of bus bar chamber using vacuum cleaner
  - Conducting jelly shall be applied on AL/CU joints as per manufacturer's recommendations
  - HV test in case of 1-IV switchboard
- xiii Following tests/Checks shall also be performed on the switchboards
- Functional verification of individual feeders including all spare feeders
  - Simulation test for under voltage tripping of related feeders such as motor feeder, capacitor feeders etc.
  - Verification of control supply schemes
  - Simulation test for bus auto/manual change over scheme
  - Checks for all panel illuminations, indicating lamps, sockets
  - All upstream and downstream interlocks
  - Contact resistance shall be measured for all phases/neutral using 100A DC kit

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### 3.5 WELDING RECEPTACLES

The welding receptacles shall be erected on steel/concrete structures as per the drawings. In isolated places a separate support shall be fabricated and installed.

### 3.6 PUSH BUTTON / CONTROL STATIONS

The push buttons / control stations shall be installed near to the motors to be controlled. Individual channel supports shall be installed. All outdoor push buttons / control stations shall preferably have integral canopies for additional weather protection. The canopy shall be made of 2 mm thick galvanized sheet steel or FRP where these are not integral with the equipment.

### 3.8 SUBSTATION ACCESSORIES

Contractor shall provide the following items in substation (New PMCC porta cabin), as per Indian Electricity Rules:



- A. Fire buckets filled with clean dry sand and ready for immediate use for extinguishing fires and fire extinguisher (carbon dioxide, dry chemical extinguisher etc.) suitable for dealing with electric fires shall be conspicuously marked and kept.
- B. First aid boxes containing ointments and medicines for immediate treatment of injuries (As prescribed by Indian Red Cross Society or equivalent).
- C. Instructions of restoration of persons suffering from electric shock in English, Hindi and local language of the district shall be affixed in a conspicuous place.
- D. Danger boards (HV, MV) shall be provided on transformer gate, switchboards, entrance to switchgear room and at other places as required by Engineer-in-charge.

### 4.0 EQUIPMENT COMMISSIONING

- 4.1 Field inspection, testing and commissioning of the complete electrical installation shall be carried out as per specification.

After the equipment is installed properly in accordance with drawings and specifications, contractor shall carry out all pre-commissioning checks and tests in presence of Engineer-in-charge and test readings shall be recorded and furnished in to Credo in triplicate.

- 4.2 All equipment layout drawings shall be marked by the Contractor for "AS BUILT STATUS" and two sets of hard copies along with CD shall be submitted to Sun Petro.

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## 5.0 LIST OF CONSTRUCTION EQUIPMENT



The contractor shall have all necessary construction equipment, tools and tackles and testing instruments to carry out the erection works and to commission the system. These shall include but not be limited to the following, and these shall be brought to site by contractor before the start of work.

### 5.1 Equipment:

- i. Portable grinder.
- ii. Portable welding machine.
- iii. Portable gas cutting / welding set.
- iv. Pipe threading machine.
- v. Pipe bending machine (hydraulic)
- vi. Portable drill machine suitable to take up drilling for different sizes as per requirement.
- vii. Dewatering pump sets (diesel driven).
- viii. Power Hacksaw.
- ix. Conduit dye set.
- x. Hydraulic crimping machine with round/hexagonal dye set.
- xi. Hand crimping tool.
- xii. Portable electric blowers, vacuum cleaners.
- xiii. Miscellaneous items such as slings, pulleys, tarpaulins, wooden sleepers, ladders. etc. as required.
- xiv. Safety belts, safety goggles, and gloves.
- xv. Separate tool kit for each Electrician.
- xvi. Hydraulic/Hand held grease gun

### 5.2 Test Instruments:

- i. Insulation tester 1000 V hand driven.
- ii. Insulation tester 2500 V motor/hand driven.
- iii. Insulation tester 5000 V motor/hand driven.
- iv. Phase sequence indicator.
- v. Earth Resistance tester.
- vi. Single phase variac
- vii. 3 phase variac of adequate capacity.
- viii. Secondary and primary injection testing kit,
- ix. Multimeter, both analogue and digital
- x. Portable Ammeters, Wattmeters, P.F. meters.
- xi. Portable Voltmeters.
- xii. Tacho-meter,
- xiii. D.C. high -pot test kit.
- xiv. A.C. high -pot test kit.

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- xv. Oil filtration machine of adequate capacity.
- xvi. Lux Meter to measure illumination levels.
- xvii. Breaker timing 3 pole kit
- xviii. Timers
- xix. 100A DC mili volt drop(Contact resistance) kit
- xx. Vibration measuring Instrument
- xxi. Thermo meters

## **B. SPECIFICATION FOR CABLES**

### **1.0 SCOPE**

This specification defines the requirements for supply of materials, wherever applicable, installation, testing and commissioning of cable installation.

### **2.0 CODES & STANDARDS**

- 2.1 The work shall be carried out in the best workman like manner in conformity with this specification, installation standards, layout drawings, the latest edition of relevant specifications, codes of practice of Bureau of Indian Standards listed below:

SP: 30 (BIS)	Special Publication - National Electrical Code.
IS: 1255	Code of practice for installation and maintenance of power cables up to and including 33 KV rating.
IS: 10810 (Part 43)	Method of Test for cables; Part 43 Insulation resistance.
IS: 10810 (Part45)	Method of Test for cables; Part 45 High voltage test.

- 2.2 In addition to the above it shall be ensured that the installation conforms to the requirements of the following as applicable:



- a. Indian Electricity Act and Rules.
- b. Regulations laid down by CEA/Electrical Inspectorate.
- c. Any other regulations laid down by central / state / local authorities and insurance agencies

### **3.1 MATERIAL SPECIFICATION**

All materials and hard wares to be supplied by the contractor shall be new, unused and of best quality and shall conform to the latest specifications of Bureau of Indian Standards.

### **3.2 Cable Glands**

Cable glands shall be of nickel-plated brass. The cable glands for terminations shall be weather protected, double compression type. Cable glands forming a part of relevant FLP enclosure shall

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be FLP type, tested by CEMFR or any other recognized independent testing laboratory and approved by CCOE/DGMS or any other statutory authority as applicable. Indigenous FLP glands shall have valid BIS license as per the requirements of statutory authorities.

Entry thread of cable gland shall be compatible to the entry thread provided in the equipment (BS, ET, NPT, and PG as applicable). If required, suitable reducers/adapters shall be used.

**Industrial Cable glands:** Ex-“d”, Gas group should be IIA/IIB and suitable for Zone 1 and 2  
Supply of Industrial Type, Double Compression, extruded anodised double compression Cable Glands, MOC-SS304, for the following different sizes of cables; Glands shall be complete with double seal cone grip arrangement and PVC hood. Contractor shall check cable diameter with & without armoured and type of threads (ET) prior to supply. Ex-d, FLP-Gas group should be IIA/IIB and suitable for Zone 1 and 2.

**Make:** Comet, FCG, Sudhir, ex-protecta

### 3.3 Connectors

Cable terminations shall be made with crimped type tinned copper lugs.

## 4.1 CABLES



### 4.2 General

Cable supply & installation shall include power, control, lighting, fire alarm, telephone and communication cables. These shall be laid in trenches/ cable trays /Duct as detailed in the cable Layout drawings. Cable routing given on the cable layout drawings shall be checked in the field so as to avoid interference with structures, heat sources, drains, piping, air- conditioning duct etc. Any change in routing shall be done to suit the field conditions wherever deemed necessary, after obtaining approval of Engineer-in-charge.

- 4.2.1 Medium voltage power and control cables shall be separated from each other by adequate spacing or by running through independent pipes, trenches or cables trays, as shown on layout drawings/installation standards. Details of cable routes and cable spacing not shown in detail on these drawing shall be determined by the contractor and approved by the engineer- In-charge.

When single core cables are laid in flat formation, the individual cable fixing clamps and spacers shall be of non-magnetic material. As a general practice, the sheath of single core cables shall be earthed at one point to keep sheath at earth potential unless otherwise stated. Single core cables, when /aid in trefoil formation shall be braced by suitable clamps at a distance, not exceeding 3 meters along the cable routing.

- 4.2.2 The lengths indicated in the cables schedule are only approximate. The contractor shall ascertain the exact length of cable for a particular feeder by measuring at site. All cable routes shall be

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carefully measured. Before the start of cable laying, the contractor shall prepare cable drum schedule and get that approved by Engineer-in-charge to minimize/avoid straight through joints and then the cables cut to the required lengths, leaving sufficient lengths for the terminations of the cable at both ends. The various cable lengths cut from the cable reels shall be carefully selected to prevent undue wastage of cables. Extra loop length shall be given for feeder cables where required as per the directions of Engineer-in-charge to meet contingencies

Cables shall be laid in directly buried trench or in RCC trench (underground trench) or in cable tray along pipe sleepers or in overhead trays as shown on cable layout drawings.

Overhead trays shall be installed 2700 mm (minimum) above grade level and 300 mm above FGL in case cable trays are installed along with pipe sleepers. At road crossings overhead trays shall be installed at 7000 mm (minimum) above grade level or cables shall be routed in cable tray culvert/ Electrical road crossings as per layout drawings.

Sufficient care shall be taken while laying cables to avoid formation of twist, sharp bend etc. in order to avoid mechanical injuries to cables. Rollers shall be used for pulling of cables.

Cable installation shall provide minimum cable bending radii as recommended by cable manufacturer.



4.2.3 Cables shall be neatly arranged in the trenches / trays in such a manner that criss-crossing is avoided and final take off to the motor / switchgear is facilitated. Arrangement of cables within the trenches / trays shall be in line with cable layout drawings. Cable routing between cable trench and equipment/motors shall be taken through GI pipe sleeves of adequate size. Pipe sleeves shall be laid at an angle of maximum 45 to the trench wall. Bending radii of pipes shall not be less than 8D. It is to be ensured that both the ends of GI pipe sleeves shall be sealed with approved weather proof sealing plastic compound after cabling. In places where it is not possible, cables shall be laid in smaller branch trenches. Different rows of cable trays shall be fixed so that the trays don't obstruct cable entry to the panels.

4.2.4 All cables shall be identified close to their termination point by cable tag numbers as per cable schedule. Cable tag numbers shall be punched on aluminium /Lead straps (2mm thick, 20 mm wide and of enough length) securely fastened to the cable and wrapped around it.

Each underground cable shall be provided with cable tags of lead /Aluminium securely fastened every 30 m of its underground length with at least one tag at each end before the cable enters/leaves the ground. In unpaved areas, cable trenches shall be identified by means of cable markers as per installation drawing. These cable markers shall be placed at location of changes in the direction of cables and at intervals of not more than 30 m and also at cable straight through joint locations.

4.2.5 All temporary ends of cables must be protected against dirt and moisture to prevent damage to



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the insulation. For this purpose, ends of cables shall be taped with an approved PVC end cap or rubber insulating tape.

- 4.2.6 Each row of cables shall be laid in place and before covering with sand. All wall openings/pipe sleeves shall be effectively sealed after installation of cables to avoid seepage of water inside building/lined trench. Every cable shall be given an insulation test in presence of Engineer-in-charge/Owner before filling the cable trench with sand. Any cable which is found defective shall be replaced.
- 4.2.7 Where cables pass through foundation walls, the necessary openings shall be provided in advance for the same by another agency. However, should it become necessary to cut holes in existing structures for example floor slab etc., the electrical contractor shall determine their location and obtain approval of the Engineer-in-charge before carrying out the same.
- 4.2.8 Cables for road crossings shall be taken through ERC (Electrical Road Crossing) as shown in the cable layout drawings.

At road crossing and other places where cables enter pipe sleeves adequate bed of sand shall be given so that the cables do not slack and get damaged by pipe ends.

- 4.2.9 Ends of cables leaving trench shall be coiled and capped and provided with protective cover till such time the final termination to the equipment is completed.

### **4.3 Cables Laid Direct in Ground**



Cables shall be laid underground in excavated cable trenches where specified in cable layout drawings. Trenches shall be of sufficient depth and width for accommodation of all cables, Cables shall be properly spaced as per installation standards. Maximum number of cable layers in trench shall be preferably limited to 6 layers.

Cables shall be laid in buried trenches at depth as shown in the cable layout drawings. It is to be ensured by the contractor that the bottom of buried trenches shall be cleared of all rocks, stones and sharp objects before cables are placed. The trench bottom shall be filled with a layer of sand or stone dust. This sand /stone dust shall be levelled and cables laid over it. These cables shall be covered with 150 mm of sand on top of the largest diameter cable and sand shall be lightly compacted. A flat protective covering of 75 mm thick second class red bricks or concrete tiles as per specification shall then be laid and the remainder of the trench shall then be back -filled with soil, rammed and levelled.

### **4.4 Above Ground Cables**

- 4.4.1 Cables installed above grade shall be run in cable trays, clamped on walls, ceiling or structures and shall be run parallel or at right angles to beams, walls or columns. Cable routing shall be planned to be away from heat sources such as hot piping, gas, water, oil drainage piping, air-



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conditioning duct etc. Each cable tray shall contain only one layer of cables as far as possible for power cables. However control cables may be laid in double layer in the cable trays.



- 4.4.2 Individual cable or small group of cables (up to 3 cables) which run along structures / walls etc. shall be clamped by means of 16 SWG GI saddles on 25 x 6 nun saddle bars. Alternatively small group of cables can be taken through 60/100/150 mm slotted channel tray or channel ISMC-75/100. Cables shall be supported so as to prevent sagging. In general, distance between supports shall be approximately 300 mm for cables up to 25 mm diameter and maximum 450 mm for cables larger than 25 mm dia. to prevent the sagging of cables.
- 4.4.3 All cable trays (other than galvanized trays) and supporting steel structures shall be painted before laying of cables. The under surfaces shall be properly degreased, derusted, descaled and cleaned. The painting shall be done with one coat of red oxide zinc chromate primer. Final painting shall be done with two coats of approved bituminous aluminum paint unless otherwise specified.
- 4.4.4 Where cables rise from trench to motor, lighting panel, control station, junction box etc., they shall be taken in GI pipe for mechanical protection up to a minimum of 300 mm above grade for outdoor area. Cable ends shall be carefully pulled through conduit to prevent damage to cable.
- 4.4.5 All GI Pipes shall be laid as per layout drawings and site conditions. Before fabrication of various profiles of pipes by hydraulically operated bending machine (which is to be arranged by the contractor) all the burrs from the pipes shall be removed. GI Pipes having bends shall be buried in soil / concrete in such a way that the bend shall be totally concealed. For G.I. pipes buried in soil, bitumen coating shall be applied on the buried lengths, Installation of G.I. pipes shall be undertaken well before paving is completed and necessary coordination with paving agency shall be the responsibility of Electrical Contractor.
- 4.4.6 After the cables are installed and all testing is complete, conduit ends above grade shall be plugged with a suitable weatherproof plastic compound/bitumen/suitable sealing compound. Alternatively rubber bushes shall be employed for the purpose of sealing.

## **5.0 TERMINATIONS**

- 5.1 All PVC / XLPE cables up to 1100V grade shall be terminated at the equipment by means of compression type cable glands suitable for the cable size. They shall have a screwed nipple with electrical threads and check nut. The cables shall be identified close to their termination points at both the ends of cable(cable numbers shall be punched on aluminum/Lead straps 2mm thick and securely fastened to the cable, wrapped around it) and also along the route at recommended intervals, by cable tag numbers.

All cable entries for outdoor termination shall be preferably through bottom. Outdoor cable termination through top of equipment shall not be permitted.

- 5.2 Power cables cores wherever color coding is not available shall be identified with red, yellow and

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blue PVC tapes. Where copper to aluminum connections are made, necessary bimetallic washers shall be used.



- 5.3 In case of control cables, all cores shall be identified at both ends by their terminal numbers by means of PVC ferrules suitable for core size. Wire numbers shall be as per schematic/wiring/inter-connection diagram. All unused spare cores of control cables shall be neatly bunched and ferruled with cable tag at both ends, for future use.
- 5.4 Contractor shall drill holes for fixing glands wherever necessary. Gland plate shall be of non-magnetic material/ aluminum sheet in case of single core cables. All unused cable entries on equipment/panels shall be plugged/sealed.
- 5.5 The cable shall be terminated at electrical equipment/switchboards through glands of proper size. The individual cores shall then be dressed and taken along the cables ways or shall be fixed to the panels with polyethylene straps. The cable glanding shall be done as per manufacturer's instructions. Cable armor shall not be exposed after termination is complete.

In case of termination of cables at the bottom of a panel over a cable trench having no access from the bottom close fit holes shall be drilled in the gland plate for all the cables in one line, then gland plate shall be split in two parts along the centre line of holes. After fixing bottom plate, uncovered cable holes/gaps shall be sealed with cold setting compound.

- 5.6 Crimping of lugs to cable leads shall be done by hand crimping / hydraulically operated tool as per requirement. Insulation of the leads shall be removed before crimping. Conductor surface shall be cleaned and shall not be left open. Suitable conducting jelly shall be applied on the conductor lead. Lugs shall enclose all strands of cable core. Cutting of strands shall not be allowed.
- 5.7 The jointing and termination of medium voltage power cables shall be carried out by trained personnel only. Jointing and termination of high voltage cables shall be done by skilled and experienced jointer duly approved by Engineer-in-charge. Only type tested termination kits of approved make shall be used.
- 5.8 All power and control cables glands installed outdoor shall be provided with suitable sized shrouds and rates for the same shall be included in the scope of the termination of the cable glands. No separate payment is envisaged for the same.

## **6.0 TESTING & COMMISSIONING**

- 6.1 Field testing and commissioning of electrical installation shall be carried out as per QPSL specification.
- 6.2 Before energizing, the insulation resistance of every circuit shall be measured from phase to phase, phase to neutral and from phase/neutral to earth.

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6.3 The insulation resistance of directly buried cables shall be measured before cable trenches are backfilled. Measurements shall be repeated after back filling.

For cables up to 1.1 KV grade 1000 V Megger and for H.V. Cables 2.5 KV / 5 KV Megger shall be used.

6.4 D.C. High Voltage test shall be conducted on cables given below after installation.

a) All 1100 volts grade power cables in which straight through joints have been made.



b) All cables above 1100 V grade.

The DC High Voltage test shall be performed as detailed below in the presence of the Engineer- in-charge or his authorized representative only.

Cables shall be installed in final position with the entire straight through joints complete. During the high voltage test, all other electrical equipment related to the cable installation, such as switches, instrument transformers, bus bars, etc., must be earthed and adequate clearance shall be maintained from the other equipment and framework to prevent flash over.

In each test, the metallic sheath/screen/armour shall be connected to earth.

6.5 Cable schedule, cable layout drawings, Interconnection drawings shall be marked by contractor for 'AS BUILT STATUS' and two sets of copies along with CD shall be submitted to client.

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## C. SPECIFICATION FOR LIGHTING

### 1.0 SCOPE

This specification defines the requirements for the supply of equipment, materials, installation, testing and commissioning of the lighting system (lighting fixtures, lighting power distribution, telephone wiring etc.).

### 2.0 CODES & STANDARDS

- 2.1 The work shall be carried out in the best workmanlike manner, in conformity with this specification Installation Standards, and the relevant specifications/codes of practice of the Bureau of Indian Standards.
- 2.2 In addition to the above it shall be ensured that the installation conforms to the requirements of the following as applicable:
  - a. Indian Electricity Act and Rules.
  - b. Regulations laid down by CEA/Electrical Inspectorate.
  - c. Any other regulations laid down by central / state / local authorities and insurance agencies



### 3.0 EQUIPMENT SPECIFICATIONS

#### 3.2 Lighting Fixtures

The types, makes and catalogue numbers of various types of lighting fixtures shall be as given in Fixture schedule job data sheet. All lighting fixtures shall be complete with assembly, ballast, starters and capacitor, as required. Control gears shall be integral or non-integral as specified in lighting layout drawings. Unless otherwise specified, all fixtures shall be supplied complete with lamps. Ballast for fixture shall be copper wound or electronic type. The fixtures shall be of high power factor type i.e. at least 0.9 or more.

#### 3.3 Switches

Switches, manufactured in accordance with IS: 13947 shall be used for non-hazardous areas. Switches in areas where concealed wiring has been adopted, shall be flush mounting piano type unless otherwise specified. For surface conduit wiring, piano type switches in surface mounted box shall be provided. Industrial Type switches (Weather protected) shall be used for outdoor areas. Modular switches along with required boxes shall be provided for indoor application in case shown in the layout.

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### 3.4 Receptacles

Three pin type 16A/32A receptacles manufactured in accordance with IS: 1293 shall be used for non-hazardous areas. The receptacles and the controlling ON/OFF switch shall be mounted in the same enclosure box but these shall be in separate units to facilitate replacement by parts. Flush mounting type receptacles shall be used in areas where concealed wiring has been adopted and surface type shall be used in other areas. For exhaust fans and wall mounted air circulators, socket and switch enclosures shall be separate. In buildings such as sub-station, DG Shed, Workshop, maintenance shop etc. industrial type metal clad socket outlets and plugs shall be provided. These sockets shall be supplied complete with plugs. Modular type receptacles along with required boxes shall be provided for indoor application in case shown in the layout.

### 3.5 Outlet Boxes



The outlet boxes used as point outlets shall be prefabricated type 65mm deep junction boxes. Outlet boxes custom Lubricated for sockets, switches, fixtures and fan regulators etc. shall be made of MS sheet having minimum thickness of 1.6mm. Outlet boxes shall be galvanized/ nickel plated after fabrication. These shall be complete with terminal block suitable for connection of wires up to 4 sq. mm Front cover plate shall be of 3mm thick Bakelite / PE sheet. The colour shall suit the shade of the walls or shall be white if the shade of the walls is not finalised. The sheet shall extend at least 2 cm on all sides of outlet box. Cover plate shall be fixed by cadmium plated brass screws and cup washers. Outlet boxes shall be provided with adequate number of knock outs on all the sides for ease of wiring either with conduits or without conduits.

### 3.6 Conduits & Accessories

Conduits for Electrical installations shall conform to IS: 9537. The type of conduit (steel / GI / PVC) shall be as specified on drawing. Black enamelled steel or GI conduit shall be of 1.6mm thick and the minimum wall thickness of PVC conduit shall be 1.6mm. Generally PVC conduits shall be used in concealed wiring and for surface wiring GI conduit (in plant buildings) and black enamelled steel conduit (in non-plant buildings) shall be used.

### 3.7 Lighting Poles

Lighting poles shall be fabricated as per installation standards enclosed with specification from ERW steel tubular pipes of specified section, with joints, swaged together when hot and bevelled on outside edges or hexagonal shape. Poles shall be coated with bituminous preservative solution on the ground portion of the outside surface. Remainder of the outside surface shall be given one coat of red oxide primer and finished with two coats of aluminium paint. The pole shall have a marshalling box near the bottom to contain HRC fuses, a neutral link, an earth stud and terminal block. FRP type lighting poles shall be provided in case shown in the layout.

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### 3.9 Wires

Wires shall be PVC insulated and shall be of 660 Volts grade as per 15694. Conductor shall be of stranded copper and size shall be minimum 1.5 Sq. mm for lighting, 2.5 Sq. mm for 15A power socket circuits and 4 sq. mm for split A/C power socket circuits. Red/Yellow/blue wires for phases, black wire for neutral and green wire for earth shall be used (size of earth wire shall be same as for phase and neutral size). Wire size for air conditioning circuit feeders shall be as indicated in the panel schedule.

### 3.10 Ceiling Fans

Ceiling fans shall be of 1200mm sweep unless otherwise specified with double ball bearing and regulator. The suspension down rod shall be sturdy mild steel rod of adequate diameter and of minimum length of 300mm with shackles suspension arrangement as per IS. For exhaust fans, the sweep dia. and air CFM shall be as specified in job specification. Exhaust fans for battery room shall be with anticorrosive blades suitable for use in acidic fumes.

### 3.11 Decorative Switches & Sockets



Decorative lighting switches and sockets where specified, shall be modular in design. All these items shall fit into the same frame with overall standard dimensions. Frames shall be suitable for surface and flush mounting in brick / concrete wall. The frames shall be suitable for conduit entry from all the sides. Switches and sockets shall match colors of the frame and cover plates to obtain a combination which shall match decor of the interiors of Control Room, Administrative buildings, offices rooms etc.

## 4.1 LIGHTING INSTALLATION

### 4.2 General



- 4.2.1 The lighting fixtures in the plant shall be fed from lighting panel. All outdoor lighting shall be group controlled manually or through synchronous timer or photocell. Lighting wiring between panel and lighting fixtures shall be done with PVC insulated 3-core (phase, neutral and earth) copper conductor armoured cable for hazardous areas. Wiring in the building shall be done by means of 3-core copper, conductor PVC insulated, un-armoured cables, or PVC insulated copper conductor wires in conduit / Metsec channel as specified. All joints of conductors in Switch boards/JBs Fittings shall be made only by means of approved mechanical connectors (nylon/PVC connectors). Bare twisted joints shall not be permitted anywhere in the wiring system.
- 4.2.2 The lighting layouts furnished by owner will indicate approximate locations of lighting fixtures. The electrical contractor shall determine, with approval of Engineer-in-Charge, the exact locations of each fixture in order to avoid interference with piping or other mechanical equipment and also with a view to obtain as much uniform illumination as practicable, and to avoid objectionable shadows. Conduits shall be laid out by the contractor to suit field conditions and as per directions of the Engineer-in-charge.



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- 4.2.3 On walkways, platforms and other outdoor area, lighting fixtures shall be located nearer to landing of stairs or ladders, gauges, flow meters, panel boards and other equipment to provide proper illumination.
- 4.2.4 The minimum height of any lighting fixture shall be preferably not less than 2.5 meters above the floor level.
- 4.2.5 All outdoor cable terminations to outdoor junction boxes, panels, socket outlets etc. shall be through bottom or from side. Top entries for cables shall be avoided to avoid water entry. All cable glands for outdoor terminations shall be double compression type and the gland shall be covered with PVC or rubber boot shroud. All unused cable entries shall be plugged with suitable blanking plugs.
- 4.2.6 Mounting height of equipment shall be as under:-
- |                             |   |
|-----------------------------|---|
| Top of Switch Box           | 1200 mm from FFL (Finished floor level)   |
| Top of Lighting/Power Panel | 1800 mm from FFL  |
| 5/15 Amp. Receptacle        | 300 mm from FFL unless otherwise specified (1200 mm for process areas and industrial sheds) |
| Lighting fixture            | As indicated in layout drawing  |
| Exhaust fan                 | In the cut-out provided/as indicated in Layout drawings.                                    |
- 4.2.7 Fixtures shall be firmly supported from the structures. Support clamps etc. may be bolted or welded to the existing steel work or metal inserts. In case of concrete structures, where metal inserts are not available, fixtures shall be suspended from concrete surfaces with the help of anchor fasteners. In such cases special care shall be taken to see that anchoring is firm. In places where ceiling fans are provided, lighting fixtures shall be suspended below the level of fan to avoid shadow effect.
- 4.2.8 Circuit cables in a group shall be cleated to structure by using galvanised strip clamps or cable run in cable trays wherever trays are available. Spacers and cleats shall be of required size to accommodate the cables. All hardware shall be galvanised or zinc passivated. Underground lighting cables (in paved areas) shall be taken in suitable GI sleeves buried at a minimum depth of 300mm from FFL. GI pipe sleeves shall be extended to 300mm above FFL. Exact termination/layout of GI pipes (for protection of cables) shall be decided at site as per site convenience in consultation with Engineer-in-charge.
- 4.2.9 Wiring for all outlet sockets shall be done with 3 cores of equal sizes three phase, neutral and earth. The terminals of switch sockets shall be suitable to receive the size of wire specified.
- 4.2.10 All lighting fixtures shall be provided with terminal block with required terminals suitable for connection of wire up to 2.5 sq. mm copper conductor.



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4.2.11 The cable shall be straightened after unwinding it from the drum. All cables are clamped /laid in straight run without any sag and kink.

4.2.12 For location where fan points are shown, fan hooks with junction box shall be provided during concreting.

Where fan hooks and JB's are provided separately JB shall be located within a distance of 300 mm from hook for mounting of ceiling rose.

4.2.13 Industrial type plug sockets with 20A MCB or rating as per job specification shall be provided at a height of 500mm from FFL for window AC units.

Socket outlets and plugs for installation in Sub-station building, DG shed, workshop, and maintenance shop etc. shall be of industrial metal clad type.

4.2.14 Wiring for exhaust fans shall be terminated in receptacles as specified in layout drawing and the connection from receptacle to the exhaust fan shall be by means of a flexible cord equivalent in size to the main run of wires. Switch for exhaust fan shall be located in a separate switch board along with other switches.



### **4.3 Conduit System**

4.3.1 Surface or concealed conduit system of wiring shall be adopted, as specified in the drawings. Required number of pull boxes shall be used at intervals to facilitate easy drawing of wires. Separate conduit shall be run for lighting and power circuits. Further, conduits for Normal lighting/Emergency lighting/DC critical lighting shall be separate. Conduit layout shall be decided at site as per site conditions. Drop conduits for switch boards shall be decided by contractor as per wall locations shown in Architectural drawings. All exposed run of conduits on surface, shall be vertical or horizontal.

4.3.2 Only threaded type conduit fittings shall be used for metallic conduit system. Pin grip type or clamp type fittings are not acceptable. Conduit ends shall be free from sharp edges or burrs. The ends of all conduits shall be reamed and neatly bushed. Conduit shall be of minimum 25 mm dia. Maximum number of wires permissible in a conduit shall be seven/nine for wire size of 2.5 sq.mm./1.5 sq.mm. respectively.

4.3.3 The exposed outer surface of the conduit pipes, including all accessories forming part of the conduit system, shall be adequately protected against rusting. In all cases, bare threaded portion of conduit pipe shall not be exposed unless such bare threaded portion is treated with anti-corrosive preservative or covered with approved plastic compound.

4.3.4 Conduit connection to outlet boxes shall be by means of screwed hubs or check nuts on either side. Where concealed wiring is done, junction boxes (65 mm deep) shall be used so as to rest on shuttering properly. Conduits shall be laid above reinforcement. All conduit connections shall be properly screwed and Junction box covers shall be properly fitted so as to avoid entry of concrete slurry.

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4.3.5 Conduit pipes shall be fixed by 1.6mm thick GI saddles on 3mm thick GI saddle bars of required width in an approved manner at intervals of not more than 50cms for straight run. At places near junction boxes, bends, or similar fittings, saddle and bars shall be provided on either side.

4.3.6 Where concealed wiring is to be adopted, conduits shall be laid in time before concreting of the slab. Pull wire (GI or steel) shall be provided inside conduit for the ease of wire pulling. The contractor shall coordinate his work with other agencies involved in the civil works in such a way, that the work of the other agencies is not hampered or delayed. Vertical conduit runs shall be made in wall before plastering is done so as to avoid chasing. Where chases are made for conduit run contractor shall fill these chases or any other openings made by them after completing the work and patch the surface. During installation, care shall be taken to see that proper covers are provided to prevent rusting of conduits. Locations of all point outlets, junction boxes shall be marked with brick powder or sand so that these are easily identified after shuttering removal. As built conduit layout drawing shall be submitted by contractor after completion of the work.

4.3.7 All junction boxes, bends and other accessories shall be of the same material as that of conduit and shall have the same protective coatings.

4.3.8 After erection, the entire conduit system shall be tested, for mechanical and electrical continuity and shall be permanently connected to earth by means of approved type of earthing clamps.

i) Lighting Layout

ii) Type of wiring (surface conduit)



Conduit layout of circuit indicating number of wires etc. shall be provided by contractor. The number of points in a circuit shall not exceed ten and the load in each circuit shall be less than 1000 Watts.

All drawings shall be prepared preferably in A0 and A1 size. Final submission of drawings shall be in soft copies (CD form) and in bound volumes.

## **5.0 TESTING & COMMISSIONING**

5.1 Lighting installation shall be tested and commissioned by installation contractor as per specifications. Pre-commissioning checks and tests shall include but not be limited to the following:



- (i) The insulation resistance of each circuit without the lamps (load) being in place shall be measured and it should not be less than 500,000 ohms. (Between phases, phases to neutral, phase/neutral to Earth).
- (ii) Current and voltage of all the phases shall be measured at the lighting panel bus bars with all the circuits switched on with lamps. If required load shall be balanced on the three Phases.

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- (iii) The earth continuity for all socket outlets shall be checked. A fixed relative position of the phase and neutral connections inside the socket shall be established for all sockets.
- (iv) After inserting all the lamps and switching on all the circuits, minimum and maximum illumination level shall be measured in the area and recorded.
- (v) Operation of ELCB's shall be checked.

Contractor shall duly fill in all the above test results and submit the test reports to Engineer-in-Charge in triplicate.

- 5.2 All lighting layout drawings shall be marked by contractor for AS BUILT STATUS' and two sets of hard copies plus 1 set of soft copy in CD, shall be submitted to client.

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## **D. SPECIFICATION FOR EARTHING**

### **1.0 SCOPE**

This specification defines the requirements for the supply of earthing and lightning protection materials and installation of the earthing and lightning protection systems.

### **2.0 CODES & STANDARDS**

- 2.1 The work shall be carried out in the best workman like manner in conformity with this Installation Standards, layout drawings, the latest edition of relevant specifications, codes of practice of Bureau of Indian Standards

SP: 30 (BIS) Special Publication-National Electrical Code  
 IS: 2309 Protection of buildings and allied structures against lightning.  
 IS: 3043 Code of practice for earthing  
 IS: 7689 Guide for control of undesirable static electricity.

- 2.2 In addition to the above it shall be ensured that the installation conforms to the requirements of the following as applicable:  
 Indian Electricity Act and Rules.



- Indian Electricity Act and Rules.
- Regulations laid down by CEA/Electrical Inspectorate.
- Any other regulations laid down by central / state / local authorities and insurance agencies

### **3.0 MATERIAL SPECIFICATIONS**

- 3.1 All materials and hardware's to be supplied by the contractor shall be new, unused and of best quality and shall conform to the specifications given here under and to latest specifications of Bureau of Indian Standards. Contractor shall bring material samples to site and get it approved by Engineer-in-charge before installation.
- 3.2 The main earth grid conductor shall be hot dip galvanized M.S. flat. Sizes for main conductors shall be as indicated on the earthing layout drawing. Amount of galvanizing shall be 610 gm per sq. metre. Earth electrodes and Earth plate shall be as per IS 3043.

### **4.0 EARTHING NETWORK**



- 4.1 This consists of main earth conductor (grid conductor) forming a closed ring network with required number of earth electrodes connected to it to provide a common earth for electrical devices and metallic structures. From each earth electrode two distinct connections shall be made to the main earth conductor. The earth plates shall be used for taking multiple earth connections to two or more equipment.

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- 4.2 The earthing for equipment shall be tapped from the main earth conductor and not from cable tray support structure. Earth conductor when laid underground shall be at a depth of 500mm below finished grade level.
- 4.3 Joints and tapings in the main earth loop shall be made in such a way that reliable and good electrical connections are permanently ensured. All joints below grade shall be welded and shall be suitably protected by giving two coats of bitumen and covering with Hessian tape. Earth strip laid above ground shall be welded across straight through joints and joints shall be suitably protected by giving two coats of bitumen to avoid oxidation and insulation film formation of the strip surface. When two earth strips are to be joined by means of welding, lap welding with an overlapping of strip equivalent to double the width of the strip and all four sides shall be continuously welded. All joints at tapings above ground shall be by means of connector/ins. A minimum of two bolts of adequate size shall be used for this purpose. Earthing strip joints at earth plate and equipment shall be through GI bolts, nut etc.

## **5.0 INSTALLATION OF EARTH ELECTRODE**

- 5.1 Earth Electrode shall be installed as shown on installation standard and layout drawings. The location shown on the layout drawings are indicative.
- 5.2 The exact location of earth electrodes in the field shall be determined by contractor in consultation with the Engineer-in-charge, depending on the soil strata and resistivity. Earth electrodes shall be located avoiding interferences with road, building foundation, column, pipelines etc. The civil area drawings shall be referred for this. The distance between two electrodes shall not be less than twice the depth of electrode.
- 5.3 Electrodes shall preferably be located in a moist soil which has a fine texture, grain size and distribution. Wherever practicable the soil shall be dug up, all lumps broken and stones removed from the immediate vicinity of the electrodes and soil packed by watering and ramming as tight as possible.
- 5.4 The electrodes shall have a clean surface, not covered by paint, enamel, grease or other materials of poor conductivity.
- 5.5 All earth electrodes shall be tested for earth resistance by means of standard earth test meter. The tests shall take place in dry months, preferably after a protracted dry spell.
- 5.6 The disconnect facility shall be provided for the individual earth electrode to check its earth resistance periodically.
- 5.7 Location of earth electrodes shall be marked by permanent markers for easy identification. All earth Electrodes shall be serial numbered and also marked on As Built' drawing for future reference.
- 5.8 Individual earth electrodes shall be provided for each lightning arrestor and flood light mast.
- 5.9 Earthing system provided for concrete paved area by other agency where applicable; shall be connected to the plant earthing system below ground by minimum two earth connections.

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## 6.0 CONNECTION

6.1 The following shall be earthed.

- System neutral
- Current and potential transformer secondary neutral
- Metallic non-current carrying parts of all electrical apparatus such as transformers, switch-boards, bus ducts, motors, neutral earthing resistors, capacitors, UPS, battery charger panels, welding receptacles, power sockets, lighting/power panels, control stations, lighting fixtures etc.
- Steel structures/columns, rail loading platforms etc.
- Cable trays and racks, lighting mast and poles
- Storage tanks, spheres, vessels, columns and all other process equipment. Fence and Gate for electrical equipment (e.g. transformer, yard etc.) Cable shields and armour
- Flexible earth provision for Truck
- Shield wire

Conductor size for branch connection to various equipment shall be stated on earthing layout drawings.



6.2 Steel pipe racks in the process units and offsite area shall be earthed at every 30 meters.

6.3 Lightning protection shall be provided for the equipment, structures and buildings as shown on layout drawing. Self-conducting structures shall not require separate aerial rod and down conductors. These shall however be connected to the earthing system at two or more points as shown on layout drawing. An independent earthing network shall be provided for lightning protection and this shall be bonded at least at two points with the main earthing network below ground. Lightning down conductor shall be brought to earth electrode in shortest straight path as feasible to minimize surge impedance.

6.4 The main earthing network shall be used for earthing of equipment to protect against static electricity.

6.5 All medium and high voltage equipment (above 250V) shall be earthed by two separate and distinct connections with earth.

6.6 Plant instrument system clean earthing, UPS system clean/safety earth shall be separate from the electrical earthing system.

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6.7 All paint, scale and enamel shall be removed from the contact surface before the earthing connections are made.

6.8 All earthing connections for equipment earthing shall be preferably from the earth plate mounted above ground wherever provided

Equipment foundation bolts shall not be used for earthing connection.

6.9 Earth connections shall be made through compression type cable lugs/by welded lugs.

6.10 All hardware used for earthing installation shall be hot dip galvanized or zinc passivated. Spring washers shall be used for all earthing connections and all connections adequately locked against loosening.

6.11 Lighting fixtures and receptacles shall be earthed through the extra core provided in the lighting circuit/cable for this purpose.

6.12 The reinforcements of sub-station building and the sub-station floor shall be connected to main earth grid.

## **7.0 TESTING & COMMISSIONING**

7.1 Field inspection, testing and commissioning of electrical installation shall be done as per IS: 3043 standard specifications. Earthing systems/connections shall be tested as follows:

7.2 Resistance of individual earth electrodes shall be measured after disconnecting it from the grid by using standard earth test meggar.

7.3 Earthing resistance of the grid shall be measured after connecting all the earth electrodes to the grid. The resistance value of an earth grid to the general mass of earth shall be as follows:



- For the electrical system and equipment, a value that ensures the operation of the protection device in the electrical circuit but not in excess of 4 ohm. However, for generating stations and large sub-systems, the value shall not be more than 1 ohm.
- For lightning protection, the value of 5ohms as earth resistance shall be desirable, but in no case it shall be more than 10 ohms.

7.4 The resistance to earth shall be measured typically at the following points:

- a. At each electrical system earth or system neutral earth.
- b. At each earth provided for structure lightning protections.
- c. At one point on earthing system used to earth electrical equipment enclosures.

7.5 All earthing layout drawings be marked by contractor for AS BUILT STATUS' and two sets of hard copies plus 1 set of soft copy in CDs, shall be submitted to Credo.



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## **E. SPECIFICATION FOR FIELD INSPECTION, TESTING & COMMISSIONING OF ELECTRICAL INSTALLATIONS**

### **1.0 SCOPE**

This specification covers the requirements for the field inspection, testing and commissioning of Electrical Equipment and Installation, forming part of electrical power distribution and utilisation system.

### **2.0 CODES & STANDARDS**

2.1 The field inspection, testing and commissioning of electrical equipment shall be carried out in line with this specification and the latest edition of following Indian Standards.

SP-30(BIS)	National Electrical Code.
IS 1255	Code of practice for installation and maintenance of power cables up to & including 33 kV rating.
IS-7816	Guide for testing Insulation resistance of rotating machines.
IS 10810(Part 43)	Method of Test for cables; Part 43 Insulation resistance.
IS 10810(Part 45)	Method of Test for cables; Part 45 High voltage test.
IS 12729	HV Switchgears

2.2 In addition to the above it shall be ensured that the installation conforms to the requirements of the following as applicable:



- a. Indian Electricity Act and Rules.
- b. Regulations laid down by CEA / Electrical Inspectorate.
- c. Regulations laid down by Tariff Advisory Committee/Loss prevention council.
- d. Any other regulations laid down by central / state / local authorities / insurance agencies

### **3.0 FIELD INSPECTION, TESTING & COMMISSIONING**

3.1 Contractor shall carry out complete field inspection, testing and commissioning of electrical equipment as per Inspection & Test plans.

3.2 Before the completed installation is put into service, inspection / pre-commissioning checks and tests shall be carried out by contractor. In the event of defects being found out, the same shall be rectified and the installation retested as applicable.

3.3 The pre-commissioning inspection among other requirements shall include visual inspection, checking the workmanship of the installation, the rating of equipment, safety clearances, sizes of cables installed, soundness of switchgear bus connections, wiring properly dressed and labelled, sealing of unused cable entries, checking of all safety interlocks, control/interface functions as per requirement etc.



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- 3.4 Visual inspection for soundness of bus bar connections of bus ducts, terminal connections of equipment/motor shall be carried out. It shall be ensured that no foreign materials are present inside bus duct and equipment terminal boxes. After the visual inspection, all the covers of terminal boxes, inspection chambers shall be refitted with gaskets, bolts & nuts as per equipment manufacturer's instructions.

3.5 Pre-commissioning tests shall include but not be limited to the following:

- Continuity test for each winding and power and control circuits.
- Insulation test for each winding and power and control circuit
- High voltage test for cables (Separate Testing for HT/LT system)
- Dielectric strength test on transformer oil.
- Checking the correctness of wiring schemes, control circuit interlocks for intended functioning.
- Verification of phase sequence.
- Testing of all types of relays/releases for required operation.
- Testing of measuring instruments for proper functioning.
- Earth continuity test for all circuits.
- Checking of safety features for correctness of operation, etc.
- Checking of all wired interface contacts (analogue, digital input/output contacts) for DCS and ECS interface, at panel and equipment terminal chambers as applicable.
- (Electrical contractor shall co-ordinate with other agencies involved for the above and provide support services for checking interfaces of electrical equipment and the intended functioning)
- Earth resistance measurement for each earth electrode, and the earthing system as a whole.

- 3.6 After the above tests and inspection are completed, control circuits shall be tested for correct operation under all operating combinations and proved correct before applying power to main circuit.
- 3.7 Site Acceptance Test procedure for specific equipment shall be furnished by the respective equipment vendor. The contractor shall provide necessary assistance to the equipment vendor to perform Site acceptance testing to enable the equipment vendor to perform the same.
- 3.8 All pre-commissioning checks and tests shall be carried out as per the directions of Engineer-in-charge. In addition to the equipment manufacturer's instructions, pre-commissioning check requirements shall also be complied. All tests shall be carried out by contractor in the presence of Owner's representatives.
- 3.9 The contractor shall bring to site all required tools, tackles, and testing instruments for carrying out field testing. Contractor shall use only calibrated measuring and test instruments and shall maintain valid calibration records.

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3.10 The **Insulation Resistance** test values for various electrical equipment shall be as below:

#### 3.10.1 Cables

The insulation resistance test values for cables shall be as per following table:

<b>Rated voltage of the Cable</b>	<b>DC Test Voltage in Volts</b>	<b>Minimum Insulation resistance in Mega ohms at 40°C</b>
Lighting and power circuit wiring =	250	1
650/1100V grade cables	1,000	10
6,350/11,000V grade cables	5,000	200

#### 3.10.2 , MV and Miscellaneous Switchboards

The insulation resistance test values for the switchboards shall be as per following table:

<b>Rated voltage of the Switchboard</b>	<b>DC Test Voltage in Volts</b>	<b>Minimum Insulation resistance in Mega ohms at 40°C</b>
415V	1,000	100
240V	500	10

#### 3.10.3 Generators and Motors



The insulation resistance test values for the Generators and Motors shall be as per following table:

<b>Rated voltage of the Generators and Motors</b>	<b>DC Test Voltage in Volts</b>	<b>Minimum Insulation resistance in Mega ohms at</b>
415V	1,000	15
240V	500	12

It shall be ensured that during insulation tests, electronic devices and components that are liable to get damaged on applied test voltage shall be disconnected from circuit. The instructions of equipment/panel manufacturer shall be followed strictly in this regard.

### 3.11 HIGH VOLTAGE TESTING

3.11.1 DC high voltage test shall be conducted as per following table on all I-W feeder cables and also on 1100 V grade cables where straight through joints have been made,

	<b>CONSTRUCTION CONTRACTOR SCOPE FOR ELECTRICAL WORKS</b>	
<b>DOC. NO.:</b> BHII-CPF-ELE-SOW-5021	<b>CLIENT:</b> SUN PETROCHEMICALS PVT LTD.	
<b>PROJECT NO.:</b> 23134	<b>PROJECT:</b> CENTRAL PROCESSING FACILITY AUGMENTATION (FOR 12000 BOPD)	<b>REV:</b> 0

Rated Voltage of Cable (kV)	TEST VOLTAGE (kV) BETWEEN		Duration (Minutes)
	Any Conductor and Metallic Sheath/ Screen/Armor	Conductor to Conductor	
0.65/1.1	3	3	5
6.35/11	18	30	5

\*  $U_0$ : Phase Voltage

U: Line Voltage

The cable cores must be discharged on completion of DC high voltage test and cable shall be kept earthed until it is put into service.



DC test voltage for old cables shall be 1.5 times rated voltage or less depending on the age of cables, repair work or nature of jointing work carried out, etc. In any case, the test voltage shall not be less than the rated voltage.

3.11.2 All protective relays including thermal overload relays shall be tested by secondary injection current.

3.11.3 It shall be ensured that the electrical inspectorate approval is available before energizing the equipment




#### 4 RECORDS



Contractor shall keep up-to-date records of all activities carried out and test results. Field inspection / test reports shall be submitted Owner by the contractor in bound volumes (triplicate copies).

	<b>CONSTRUCTION CONTRACTOR SCOPE FOR INSTRUMENTATION &amp; CONTROL</b>	
<b>DOC NO:</b> BHII-CPF-INI-SOW-6014	<b>CLIENT:</b> SUN PETROCHEMICALS PVT LTD.	<b>REV:</b> 0
<b>PROJECT NO:</b> 23134	<b>PROJECT:</b> CENTRAL PROCESSING FACILITY AUGMENTATION (FOR 12000 BOPD)	<b>DATE:</b> 05/10/2023

# **CONSTRUCTION CONTRACTOR SCOPE FOR INSTRUMENTATION AND CONTROLS**



**Document No: BHII-CPF-INS-SOW-6014**

					
0	05.10.2023	Issued for Review	MM	KS	SPV
REV	DATE	PURPOSE	PREPARED BY	CHECKED BY	APPROVED BY

	<b>CONSTRUCTION CONTRACTOR SCOPE FOR INSTRUMENTATION AND CONTROLS</b>	
<b>DOC NO:</b> BHII-CPF-INI-SOW-6014	<b>CLIENT:</b> SUN PETROCHEMICALS PVT LTD.	<b>REV.:</b> 0
<b>PROJECT NO.:</b> 23134	<b>PROJECT:</b> CENTRAL PROCESSING FACILITY AUGMENTATION (FOR 12000 BOPD)	<b>DATE:</b> 05/10/2023

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	<b>CONSTRUCTION CONTRACTOR SCOPE FOR INSTRUMENTATION AND CONTROLS</b>	
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<b>PROJECT NO.:</b> 23134	<b>PROJECT:</b> CENTRAL PROCESSING FACILITY AUGMENTATION (FOR 12000 BOPD)	<b>DATE:</b> 05/10/2023

## 1. INTRODUCTION

Sun Petrochemicals Private Limited (SunPetro) plans to enhance the capacity of the CPF at Bhaskar onshore field at Anand district of Gujarat, on EPC-M basis. Sun Petro plans to connect more wells to the existing CPF. Based on the CPF gap analysis study done by Global Maritime Consultants Group (GMCG) and as per Client preference it is concluded that the existing facility with minimum modifications, can help enhance production from current 7000 BOPD to 12000 BOPD. All documents are to be updated accordingly for all the engineering and delivery requirements.

GMCG Maritime Consultants Pvt Ltd has been contracted by Sun Petrochemicals Private Limited to execute relevant engineering and associated modifications in the onshore central processing facility (CPF).

## 2. PROJECT DETAILS

### 2.1. GENERAL

CLIENT / OWNER	Sun Petrochemicals Pvt Ltd
CONSULTANT	GMCG Maritime Consultants Pvt Ltd
OEM / VENDOR	The Party who supplies or manufactures the equipment's
CONTRACTOR	The Party who erects the plant in the site
PROJECT TITLE	Central Processing Facility Augmentation (12000BOPD)
SITE	Site refers to Construction Site – BHASKAR onshore field at Anand district of Gujarat

### 2.2. MEASUREMENT & CALIBRATION UNITS

Unless otherwise specified, electrical and control systems shall be measured & recorded in MKS units only.

### 2.3. TYPE OF TENDER

This is an item rate contract and Contractors / Bidders are requested to submit quotations as per the SOR. Compliance with Specifications is required by the CONTRACTOR.



### 2.4. Codes, Standards and Specifications

Unless otherwise noted on project drawings or specifications, all design, materials and equipment will meet the requirements established by the latest editions of the codes, standards and specifications. The following Indian codes and standards shall generally be used for design of Civil and Structural works. In all cases, latest revisions with amendments if any shall be followed.

#### 2.4.1. Regulation/ Statutory Approval

- All Equipment/instrument to be used in hazardous areas shall be of a type already tested by Central Mining Research Institute, Dhanbad and approved by Chief Controller of



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Explosives (CCE)/ Directorate General of Mines Safety (DGMS)/Directorate General factory Advice Service & labor Institute (DGFASLI) (as required) for used in specified gas group location.

- In case electrical equipment to be used in Hazardous area are type tested in reputed agencies outside India, the vendor shall approach applicable statutory bodies specified above and get the equipment approved by them for use in the specified area of utilization prior to bidding.

#### 2.4.2. Specifications

- Contractor also refers to Company standard specifications, and general requirements of the Company for this project.
- Include instrument data sheet if applicable.

### 3. ORDER OF PRECEDENCE

In case of any conflict between the requirements of the referenced codes, standards and specifications, the following order of precedence shall be applied. In all cases where more than one code and/or standard and/or specification applies to the same conditions, the more stringent shall apply with due approval from CLIENT:

- a) Government Regulations and Statutory Provisions
- b) Project Design Basis
- c) Project Standard Specifications
- d) Indian and International Codes and Standards



Note: In case of contradiction between the above listed codes & specifications, the more stringent shall govern.

### 4. SCOPE OF WORK



Instrumentation and Control scope of work for the project shall include supply of all materials, consumables, tools, tackles, machinery, equipment, manpower etc. required for construction, erection, installation, recalibration, testing and commissioning of all Instrument and control related works.

4.1 The scope of Contractor with respect to instrumentation and control systems includes site visits, procurement, supply, vendor drawing / document review, inspection and testing, transportation from manufacturer's works, storage at site, calibration, installation, pre-commissioning checks (cold loop and hot loop checks, C&E checking) and commissioning assistance for all instruments and related accessories which are required for satisfactory and safe performance of the unit. The scope also includes supply of spares, supply of software with licenses, special tools for configuration, transportation, and Training of the client personnel.

4.2 Existing control system including DCS, ESD and FGS shall be verified for adequacy. It shall be the responsibility of CONTRACTOR to engage existing control system vendor (For Ex. DCS : Emerson/Equivalent/SubVendor) for system integration and testing. Testing is not limited to support for loop checking activity, functional checking, cause and effect checking, etc.

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- 4.3 The hardware supply and software updates of control systems shall be the responsibility of the CONTRACTOR. Software updates are not limited to System configuration, testing, graphic design (new/ modified), FGS mimic panels reconfiguration, Configuring radio inputs, etc.
- 4.4 The CONTRACTOR may take a note of the fact there is no possibility of shutdown of existing control system, for any integration requirements of the new System with the existing control system. The CONTRACTOR shall hence along with the Control System vendor ensure that the control system is designed properly for the required signal transfers by suitable means in such a way that the overall integration of the existing control system is achieved as specified without any shutdown.
- 4.5 The CONTRACTOR shall supply as a minimum all the instruments and controls as per the SOR/MTO.
- 4.6 Integration of new signals with the existing network shall not warrant a requirement for shutdown of the existing system. Since shutdown of the existing control system leads to shutdown of the production facilities and would further incur huge economic loss, hence same will not be an acceptable proposition, in any case. Proposed methodology shall be such that complete integration shall be carried out without any shutdown.
- 4.7 The cabling from instrument to JB and from field JB to rack room, from rack room to MCC/ substation shall be buried and/or laid on new cable trays with cover, to be installed on pipe-racks/sleepers by CONTRACTOR. Suitable G.I. trays of width 150mm/ 300mm or 600 mm shall be used. Tray sizing shall be such that no more than 40% of the tray space shall be utilized.
- 4.8 Cable entry into the Substation building shall be through MCT blocks. MCT shall be sized considering 50% future spares of each type of cable and future spares shall be blocked with inserts. Directly buried cable without RCC trench, shall not be acceptable anywhere within the facility.
- 4.9 The instrument and electrical earths shall be physically and electrically isolated. There shall be a minimum separation of 20 meters between the instrument earth and electrical safety earth.
- 4.10 All instruments and Junction Boxes shall be certified suitable for hazardous area use.
- 4.11 Instrument material selection, Instrument Selection, application and installation of instruments, control equipment, tubing and wiring shall be as per specification.
- 4.12 UPS feeders shall be provided for the control system
- 4.13 All Control valves, Shutdown valves shall be as per Company specification.
- 4.14 Instrument Cables shall be as per project specification.
- 4.15 Contractor to consider Site visit to finalization of various interface with existing Control room, in field and with existing control system.
- 4.16 Contractor shall remove, refurbish, replace, reinstall and functional check control

	<b>CONSTRUCTION CONTRACTOR SCOPE FOR INSTRUMENTATION AND CONTROLS</b>	
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valves, safety valves and orifice plates where necessary.

- 4.17 All instruments and safety valves (new/ refurbished) shall be calibrated and witnessed by third party inspector.
- 4.18 Contractor shall install and hookup all instruments in line with the hookup drawings.
- 4.19 Junction boxes shall be installed as per layout drawings.
- 4.20 Body earthing shall be done / modified shall be done for all instruments.
- 4.21 Termination of signal cables of pump seal plan instruments, MOVs, Differential pressure transmitters, Flame detectors, other refurbished instruments, etc. shall be carried out on instrument side, JB side and marshalling cabinets.
- 4.22 MCC interface signals shall be terminated on marshalling cabinet side and MCC side and checked for functionality.



## 5.0 SCOPE OF SUPPLY

CONTRACTOR shall supply all required instruments and materials including consumables. All instrument items supplier shall have a valid Proven Track Record (PTR) for a minimum 6 months in Hydrocarbon industry.

- 5.1. The procurement / supply at the appropriate time (of all materials and consumables) shall be entirely the CONTRACTOR's responsibility and their rates for execution shall be inclusive for all these items. CONTRACTOR shall envisage all such items required to be supplied. Items that need to be supplied by CONTRACTOR are as follows, but not limited to:
  - 5.1.1. All Instruments including local gauges, sensing elements, transmitters, Control valves, Shutdown valves, Safety relief valves
  - 5.1.2. Required hardware/software of existing Plant Control System (PCS), Emergency Shutdown System (ESD) and Fire & Gas System (FGS) based on adequacy report.
  - 5.1.3. Instrument, and Power Cables
  - 5.1.4. Junction boxes & Local panel with cable glands and plugs
  - 5.1.5. Power Distribution Boards
  - 5.1.6. Any Software with the required license for the instruments / control systems supplied
  - 5.1.7. Instrument Earthing pits – Electronic earth with less than 1 ohm resistance.
  - 5.1.8. Multi cable transit (MCT) blocks and frame for sub-station.
  - 5.1.9. Earthing cables for field instruments, Junction Boxes, Panels etc. Body earthing shall be done for all instruments, junction boxes and panels.
  - 5.1.10. adder cable trays and perforated cable trays with covers and accessories

	<b>CONSTRUCTION CONTRACTOR SCOPE FOR INSTRUMENTATION AND CONTROLS</b>	
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- 5.1.1. Separate Cable trays for Instrument Cables, Power Cables and Tubing
- 5.1.2. All impulse pipe fittings, flanges and valves for impulse lines
- 5.1.3. Tubes and tube fittings for impulse lines & air distribution.
- 5.1.4. RP canopies for all electronic instruments and junction boxes.
- 5.1.5. Mounting screws, Bolts and nuts required for instruments, tray supports, junction boxes, tubes, cables and pipes.
- 5.1.6. All steel like flats, angles channel, and metal sheet required for fabrication of supports for ladder trays, perforated trays, instruments, impulse tubes etc.
- 5.1.7. Minor civil works required for anchoring of instrument supports wherever required.
- 5.1.8. All configuration tools (hardware/software) necessary for configuration of programmable/configurable devices. The portable tools for configuration in field shall be suitable for use in hazardous area.
- 5.1.9. Additional basic supports required for cable tray routing and supporting.
- 5.1.10. Teflon tape and other pipe joining compounds for threads
- 5.1.11. Lugs, Wire sleeves for instrument cables. Tags/ferrules for identification of tubes / wires at panel/junction boxes. All the cables shall be provided with printed shrink fit sleeve ferrules.
- 5.1.12. SS name plate tags for identification of single and multipair/multicore cables at the instrument end, junction box end and the marshalling end
- 5.1.13. All accessories for electrical wiring like cable lugs, ferrules for identification of cables, cable clamps etc. Cable clamps shall be provided for tying the cables inside the cable trays after every two meters & splicing kit for FO cables.
- 5.1.14. Any special tools/equipment for instrumentation items.
- 5.1.15. Threading and bevelling of Nipples from pipe pieces, welding, and protection of Instruments by adequate bags till commissioning, etc.
- 5.1.16. During the course of execution if the spare entry plugs of JB's /Local panels, cover bolts, gaskets, etc. are missed/lost the same shall be provided by the CONTRACTOR
- 5.1.17. Standard testing and inspection equipment like test benches, calibration equipment required for erection / installation should be made available at site in adequate quantity
- 5.1.18. All unused ports and entries shall be plugged with metallic plugs. Plugs for electrical entries shall be certified for the hazardous area and material shall be same as that of the cable gland.
- 5.1.19. Any other item not specified, but required for the completion of the job.
- 5.1.20. Control valve trims/ bodies, safety valve trims/ bodies necessary for respective refurbishment.
- 5.1.21. Replacement of orifices.

	<b>CONSTRUCTION CONTRACTOR SCOPE FOR INSTRUMENTATION AND CONTROLS</b>	
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## 6 AS BUILT DRAWINGS / DOCUMENTS

All as-built drawings, documents in Native format shall be submitted to CLIENT in CD ROM as well as in Hard Copies.

## 7 DEVIATION

CONTRACTOR shall ensure compliance to all technical specifications, standards, Project Engineering Design Basis, vendor's specifications, Process package and any other Standard / Specification, which is part of this bid package. Normally deviations will not be entertained. However, in certain cases wherein CONTRACTOR deems necessary to seek deviations to the above specifications, same shall be forwarded on the standard deviation permit formats enclosed in the bid package. Until the deviation requested by CONTRACTOR is approved by CLIENT, CONTRACTOR shall not proceed further with Engineering / Construction / Procurement. Any delay arising due to the deviations sought shall be the sole responsibility of the CONTRACTOR and no schedule extensions shall be granted.

CONTRACTOR to also note that any financial implications arising due to dilution of technical specification while accepting deviations shall be chargeable to the CONTRACTOR based on assessments made by CLIENT in this regard, however no extra claims shall be admissible in case of upgradation of specifications.



## SCHEDULE OF RATES (MECHANICAL)



DOC. NO: BHII-CPF-MEC-SOR-2018

CLIENT: SUN PETROCHEMICALS PVT LTD.

REV: 00

PROJECT NO: 23134




PROJECT: CENTRAL PROCESSING FACILITY AUGMENTATION



DATE: 05/10/2023

## CENTRAL PROCESSING FACILITY AUGMENTATION

### SCHEDULE OF RATES (MECHANICAL)

DOCUMENT NO: BHII-CPF-MEC-SOR-2018

					
0	05-10-2023	Issued for Approval	MM	KS	SPV
Rev	DATE	Purpose of Issue	Prepared by	Checked by	Approved by

		SCHEDULE OF RATES - MECHANICAL					
PROJECT						DOCUMENT NO:	
CENTRAL PROCESSING FACILITY AUGMENTATION						BHII-CPF-MEC-SOR-2018	
						REV: 0	
SR. No.	Description	Qty.	Unit	Unit Rate (INR) - Dismantling	Unit Rate (INR) - Erection and Alignment	Total Price	
A	DISMANTLING						
	Disconnecting from piping, removal of inline valves, instruments as applicable, disconnecting electrical connection, removal of instrument connections, securing the instruments mounted on the pump skid and securing the equipment, piping, removal from foundation along with base frame, demolishing the grouting and ensure safe removal of the pumps without causing damage to the equipment is in the scope of the CONTRACTOR. Work shall be done according with OEM procedure and in case required OEM representative shall be present during the exercise.						
1	Dismantling of existing Pumps P-104A/B and P-117 A/B	4	Nos.				
2	Dismantling of Well fluid - Crude Oil Interchanger (E-101 & E-102)	2	Nos.				
B	ERECTION & ALIGNMENT						
	Receipt, unloading, surface preparation, lifting of pumps, alignment, installation, grouting, levelling of Pumps, Heat exchanger and miscellaneous Mechanical equipment including supply of equipment for erection, supply of foundation bolts, shim plates, necessary instrument for alignment, hook-up with piping, electrical and instrumentation shall be part of the CONTRACTOR's scope.						
1	Feed Booster Pumps - P-101C/D (For details of the pump refer to the equipment list and the Vendor drawings for weights and dimensions)	2	Nos.				
2	Export Oil Pumps - P-102C/D (For details of the pump refer to the equipment list and the Vendor drawings for weights and dimensions)	2	Nos.				
3	Tank bottom recycle pump - P-104 A/B (For details of the pump refer to the equipment list and the Vendor drawings for weights and dimensions)	2	Nos.				
4	Pump house drain pit oil lifting pump - P-117 A/B (For details of the pump refer to the equipment list and the Vendor drawings for weights and dimensions)	2	Nos.				
5	Well fluid - Crude oil interchanger (E-101) (For details of the pump refer to the equipment list and the Vendor drawings for weights and dimensions)	2	Nos.				

**Notes:**

- 1 This SOR shall be read in conjunction with Equipment list.
- 2 Existing and new equipment data shall be referred for technical details.
- 3 CONTRACTOR to consider moving the existing Heat Exchanger E-101 and E-102 to ware house.





## SCHEDULE OF RATES - PIPING



DOC. NO: BHII-CPF-PIP-SOR-3047

CLIENT: SUN PETROCHEMICALS PVT LTD.

REV: 00

PROJECT NO: 23134



PROJECT: CENTRAL PROCESSING FACILITY AUGMENTATION



DATE: 05/10/2023

### SCHEDULE OF RATES (SOR) FOR PIPING

DOCUMENT NO: BHII-CPF-PIP-SOR-3047

0	05-10-2023	Issued for Approval	MM	KS	SPV
Rev	DATE	DESCRIPTION	Prepared by	Checked by	Approved by

		SCHEDULE OF RATES - PIPING									
PROJECT										DOCUMENT NO.	
CENTRAL PROCESSING FACILITY AUGMENTATION										BHII-CPF-PIP-SOR-3047	
										REV: 0	
SR. NO.	ITEM	ITEM DESCRIPTION	PIPE SPEC	SIZE 1 NB	SIZE 2 NB	UOM	TOTAL QTY.	UNIT RATE (INR) - SUPPLY	UNIT RATE (INR) - SERVICE	TOTAL PRICE (INR)	
1	PIPE	PIPE, SEAMLESS, BE, ASTM A106 GR.B, ASME B-36.10, 12 INCH, SCH 40	B7A	300		MTR	15				
2	PIPE	PIPE, SEAMLESS, BE, ASTM A106 GR.B, ASME B-36.10, 8 INCH, SCH 40	B7A	200		MTR	44				
3	PIPE	PIPE, SEAMLESS, BE, ASTM A106 GR.B, ASME B-36.10, 6 INCH, SCH 80	D7A	150		MTR	72				
4	PIPE	PIPE, SEAMLESS, BE, ASTM A106 GR.B, ASME B-36.10, 6 INCH, SCH 40	B7A	150		MTR	8				
5	PIPE	PIPE, SEAMLESS, BE, ASTM A106 GR.B, ASME B-36.10, 4 INCH, SCH 40	B7A	100		MTR	51				
6	PIPE	PIPE, SEAMLESS, BE, ASTM A106 GR.B, ASME B-36.10, 2 INCH, SCH 160	D7A	50		MTR	36				
7	PIPE	PIPE, SEAMLESS, BE, ASTM A106 GR.B, ASME B-36.10, 3 INCH, SCH 40	B7A	80		MTR	36				
8	PIPE	PIPE, SEAMLESS, BE, ASTM A106 GR.B, ASME B-36.10, 2 INCH, SCH 80	B7A	50		MTR	15				
9	PIPE	PIPE, SEAMLESS, PE, ASTM A106 GR.B, ASME B-36.10, 1.5 INCH, SCH 160	D7A	40		MTR	8				
10	PIPE	PIPE, SEAMLESS, PE, ASTM A106 GR.B, ASME B-36.10, 1 INCH, SCH 160	D7A	25		MTR	8				
11	PIPE	PIPE, SEAMLESS, PE, ASTM A106 GR.B, ASME B-36.10, 1 INCH, SCH 80	B7A	25		MTR	51				
12	PIPE	PIPE, SEAMLESS, PE, ASTM A106 GR.B, ASME B-36.10, 0.75 INCH, SCH 160	B7A	20		MTR	8				
13	ELBOW	ELBOW 90, LR, BW, ASTM A234 WPB-S, ASME B-16.9, 12 INCH, SCH 40	B7A	300		NOS	3				
14	ELBOW	ELBOW 45, LR, BW, ASTM A234 WPB-S, ASME B-16.9, 12 INCH, SCH 40	B7A	300		NOS	3				
15	ELBOW	ELBOW 90, LR, BW, ASTM A234 WPB-S, ASME B-16.9, 8 INCH, SCH 40	B7A	200		NOS	22				
16	ELBOW	ELBOW 45, LR, BW, ASTM A234 WPB-S, ASME B-16.9, 8 INCH, SCH 40	B7A	200		NOS	6				
17	ELBOW	ELBOW 90, LR, BW, ASTM A234 WPB-S, ASME B-16.9, 6 INCH, SCH 80	D7A	150		NOS	21				
18	ELBOW	ELBOW 90, LR, BW, ASTM A234 WPB-S, ASME B-16.9, 4 INCH, SCH 40	B7A	100		NOS	10				
19	ELBOW	ELBOW 90, LR, BW, ASTM A234 WPB-S, ASME B-16.9, 3 INCH, SCH 40	B7A	80		NOS	6				
20	ELBOW	ELBOW 90, LR, BW, ASTM A234 WPB-S, ASME B-16.9, 2 INCH, SCH 160	D7A	50		NOS	12				
21	ELBOW	ELBOW 90, LR, BW, ASTM A234 WPB-S, ASME B-16.9, 2 INCH, SCH 80	B7A	50		NOS	10				
22	ELBOW	ELBOW 90, SW, 3000#, ASTM A105, ASME B-16.11, 1.5 INCH, SCH 160	D7A	40		NOS	4				
23	ELBOW	ELBOW 90, SW, 3000#, ASTM A105, ASME B-16.11, 1 INCH, SCH 80	B7A	25		NOS	17				
24	TEE	TEE, BW, ASTM A234 WPB-S, ASME B-16.9, 12 INCH, SCH 40	B7A	300		NOS	3				
25	TEE	TEE, BW, ASTM A234 WPB-S, ASME B-16.9, 8 INCH, SCH 40	B7A	200		NOS	8				
26	TEE	TEE, BW, ASTM A234 WPB-S, ASME B-16.9, 6 INCH, SCH 80	D7A	150		NOS	5				
27	TEE	TEE, BW, ASTM A234 WPB-S, ASME B-16.9, 4 INCH, SCH 40	B7A	100		NOS	3				
28	TEE	TEE, BW, ASTM A234 WPB-S, ASME B-16.9, 2 INCH, SCH 80	B7A	50		NOS	4				
29	TEE	TEE, SW, 3000#, ASTM A105, ASME B-16.11, 1 INCH, SCH 160	D7A	25		NOS	4				
30	TEE	TEE, SW, 3000#, ASTM A105, ASME B-16.11, 1 INCH, SCH 160	B7A	25		NOS	16				
31	RED. TEE	RED.TEE, BW, ASTM A234 WPB-S, ASME B-16.9, 6 INCH X 4 INCH, SCH 40	B7A	150	100	NOS	5				
32	RED. TEE	RED.TEE, BW, ASTM A234 WPB-S, ASME B-16.9, 4 INCH X 2 INCH, SCH 40/80	B7A	100	50	NOS	4				
33	RED. TEE	RED.TEE, BW, ASTM A234 WPB-S, ASME B-16.9, 3 INCH X 2 INCH, SCH 40/80	B7A	80	50	NOS	3				
34	BALL VALVE	BALL VALVE, BODY: ASTM A216 GR.WCB, SEAT: RPTFE, STEM: AISI 410/SS316, REDUCE BORE, 300#, 125-250 μAARH, EN ISO 17292, OPERATION: GEAR OPERATED, 12 INCH	B7A	300		NOS	5				
35	BALL VALVE	BALL VALVE, BODY: ASTM A216 GR.WCB, SEAT: RPTFE, STEM: AISI 410/SS316, REDUCE BORE, 300#, 125-250 μAARH, EN ISO 17292, OPERATION: GEAR OPERATED, 8 INCH	B7A	200		NOS	6				
36	BALL VALVE	BALL VALVE, BODY: ASTM A216 GR.WCB, SEAT: RPTFE/DEVLON, STEM: AISI 410, FULL BORE, 600#, 125-250 μAARH, EN ISO 17293, OPERATION: GEAR OPERATED, 6 INCH	D7A	150		NOS	5				
37	BALL VALVE	BALL VALVE, BODY: ASTM A216 GR.WCB/A105, SEAT: RPTFE, STEM: SS316, FULL BORE, 600#, 125-250 μAARH, EN ISO 17292, OPERATION: LEVER, 1 INCH	D7A	25		NOS	6				
38	BALL VALVE	BALL VALVE, BODY: ASTM A216 GR.WCB/A105, SEAT: RPTFE, STEM: SS316, REDUCE BORE, 300#, 125-250 μAARH, EN ISO 17292, OPERATION: LEVER, 1 INCH	B7A	25		NOS	14				
39	GATE VALVE	GATE VALVE, BODY: ASTM A216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL, 300#, 125-250 μAARH, API-600, OPERATION: HANDWHEEL, 8 INCH	B7A	200		NOS	4				
40	GATE VALVE	GATE VALVE, BODY: ASTM A216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL, 600#, 125-250 μAARH, API-600, OPERATION: HANDWHEEL, 6 INCH	D7A	150		NOS	4				
41	GATE VALVE	GATE VALVE, BODY: ASTM A216 GR.WCB, TRIM-STELLITED, FLGD, 900#, ASME B - 16.5, RTJ/63AARH, API-600, 0.75 INCH	E7A	20		NOS	14				
42	NRV	CHECK VALVE, RF, BODY: ASTM A216 GR.WCB, TRIM-STELLITED, STEM-13%CR. STEEL, 600#, 125-250 μ AARH, 6 INCH	D7A	150		NOS	5				
43	NRV	CHECK VALVE, RF, BODY: ASTM A216 GR.WCB, TRIM-STELLITED, STEM-13%CR. STEEL, 300#, 125-250 μ AARH, 1 INCH	B7A	25		NOS	6				
44	CON. REDUCER	CON. REDUCER, BW, ASTM A234 GR. WPB, ASME B-16.9, 8 INCH X 4 INCH SCH 40	B7A	200	100	NOS	9				
45	CON. REDUCER	CON. REDUCER, BW, ASTM A234 GR. WPB, ASME B-16.9, 6 INCH X 3 INCH SCH 80	D7A	150	80	NOS	9				
46	CON. SWAGE	CON. SWAGE, PBE, 3000#, ASTM A105, BS 3799, 2 INCH X 1.5 INCH	D7A	50	40	NOS	4				
47	CON. SWAGE	CON. SWAGE, PBE, 3000#, ASTM A105, BS 3799, 1 INCH X 0.75 INCH	B7A	25	20	NOS	14				
48	ECC. REDUCER	ECC. REDUCER, BW, ASTM A234 GR. WPB, ASME B-16.9, 12 INCH X 8 INCH SCH 40	B7A	300	200	NOS	4				
49	ECC. REDUCER	ECC. REDUCER, BW, ASTM A234 GR. WPB, ASME B-16.9, 8 INCH X 6 INCH SCH 40	B7A	200	150	NOS	6				
50	ECC. REDUCER	ECC. REDUCER, BW, ASTM A234 GR. WPB, ASME B-16.9, 6 INCH X 3 INCH SCH 40	B7A	150	80	NOS	4				
51	STRAINER	STRAINER 12" X 300# BASCKET TYPE 80 MICRON MESS SIZE	B7A	300		NOS	4				
52	STRAINER	STRAINER 8" X 300# BASCKET TYPE 80 MICRON MESS SIZE	B7A	200		NOS	4				
53	FLANGE	WN FLANGE, RF, 300#, ASTM A105, 125-250 μAARH, ASME B-16.5, 12 INCH, SCH 40	B7A	300		NOS	14				
54	FLANGE	WN FLANGE, RF, 300#, ASTM A105, 125-250 μAARH, ASME B-16.5, 8 INCH, SCH 40	B7A	200		NOS	30				
55	FLANGE	WN FLANGE, RF, 600#, ASTM A105, 125-250 μAARH, ASME B-16.5, 6 INCH, SCH 80	D7A	150		NOS	24				

		SCHEDULE OF RATES - PIPING									
PROJECT										DOCUMENT NO.	
CENTRAL PROCESSING FACILITY AUGMENTATION										BHII-CPF-PIP-SOR-3047	
										REV: 0	
SR. NO.	ITEM	ITEM DESCRIPTION	PIPE SPEC	SIZE 1 NB	SIZE 2 NB	UOM	TOTAL QTY.	UNIT RATE (INR) - SUPPLY	UNIT RATE (INR) - SERVICE	TOTAL PRICE (INR)	
56	FLANGE	WN FLANGE, RF, 300#, ASTM A105, 125-250 μAARH, ASME B-16.5, 6 INCH, SCH 40	B7A	150		NOS	4				
57	FLANGE	WN FLANGE, RF, 300#, ASTM A105, 125-250 μAARH, ASME B-16.5, 4 INCH, SCH 40	B7A	100		NOS	11				
58	FLANGE	WN FLANGE, RF, 600#, ASTM A105, 125-250 μAARH, ASME B-16.5, 3 INCH, SCH 80	D7A	80		NOS	9				
59	FLANGE	WN FLANGE, RF, 300#, ASTM A105, 125-250 μAARH, ASME B-16.5, 3 INCH, SCH 40	B7A	80		NOS	5				
60	FLANGE	WN FLANGE, RF, 600#, ASTM A105, 125-250 μAARH, ASME B-16.5, 2 INCH, SCH 160	D7A	50		NOS	4				
61	FLANGE	SW FLANGE, RF, 600#, ASTM A105, 125-250 μAARH, ASME B-16.5, 1.5 INCH, SCH 160	D7A	40		NOS	4				
62	FLANGE	SW FLANGE, RF, 600#, ASTM A105, 125-250 μAARH, ASME B-16.5, 1 INCH, SCH 160	D7A	25		NOS	11				
63	FLANGE	SW FLANGE, RF, 300#, ASTM A105, 125-250 μAARH, ASME B-16.5, 1 INCH, SCH 160	B7A	25		NOS	36				
64	FLANGE	SW FLANGE, RTJ, 900#, ASTM A105, 125-250 μAARH, ASME B-16.5, 0.75 INCH, SCH 160	E7A	20		NOS	15				
65	FLANGE	BLIND FLANGE, RF, 300#, ASTM A105, 125-250 μAARH, ASME B-16.5, 4 INCH, SCH 40	B7A	100		NOS	3				
66	FLANGE	BLIND FLANGE, RF, 600#, ASTM A105, 125-250 μAARH, ASME B-16.5, 1 INCH, SCH 160	D7A	25		NOS	4				
67	FLANGE	BLIND FLANGE, RF, 300#, ASTM A105, 125-250 μAARH, ASME B-16.5, 1 INCH, SCH 160	B7A	25		NOS	12				
68	SOCKOLET	SOCKOLET, 3000#, ASTM A105, MSS SP-97, 12 INCH X 1 INCH	B7A	300	25	NOS	6				
69	SOCKOLET	SOCKOLET, 3000#, ASTM A105, MSS SP-97, 8 INCH X 1 INCH	B7A	200	25	NOS	6				
70	SOCKOLET	SOCKOLET, 6000#, ASTM A105, MSS SP-97, 6 INCH X 1 INCH	D7A	150	25	NOS	4				
71	STUD BOLT	STUD BOLT, BOLT: A193GR. B7, NUT: A194 GR.2H, ASME B18.2.1/ASME18.2.2, 12 INCH	B7A	M30x170L		SET	212				
72	STUD BOLT	STUD BOLT, BOLT: A193GR. B7, NUT: A194 GR.2H, ASME B18.2.1/ASME18.2.2, 8 INCH	B7A	M24x140L		SET	238				
73	STUD BOLT	STUD BOLT, BOLT: A193GR. B7, NUT: A194 GR.2H, ASME B18.2.1/ASME18.2.2, 6 INCH	D7A	M27x170L		SET	176				
74	STUD BOLT	STUD BOLT, BOLT: A193GR. B7, NUT: A194 GR.2H, ASME B18.2.1/ASME18.2.2, 6 INCH	B7A	M20x125L		SET	33				
75	STUD BOLT	STUD BOLT, BOLT: A193GR. B7, NUT: A194 GR.2H, ASME B18.2.1/ASME18.2.2, 4 INCH	B7A	M20x110L		SET	107				
76	STUD BOLT	STUD BOLT, BOLT: A193GR. B7, NUT: A194 GR.2H, ASME B18.2.1/ASME18.2.2, 3 INCH	D7A	M20x125L		SET	64				
77	STUD BOLT	STUD BOLT, BOLT: A193GR. B7, NUT: A194 GR.2H, ASME B18.2.1/ASME18.2.2, 3 INCH	B7A	M20x110L		SET	11				
78	STUD BOLT	STUD BOLT, BOLT: A193GR. B7, NUT: A194 GR.2H, ASME B18.2.1/ASME18.2.2, 2 INCH	D7A	M16x110L		SET	22				
79	STUD BOLT	STUD BOLT, BOLT: A193GR. B7, NUT: A194 GR.2H, ASME B18.2.1/ASME18.2.2, 1.5 INCH	D7A	M20x110L		SET	11				
80	STUD BOLT	STUD BOLT, BOLT: A193GR. B7, NUT: A194 GR.2H, ASME B18.2.1/ASME18.2.2, 1 INCH	D7A	M16x90L		SET	51				
81	STUD BOLT	STUD BOLT, BOLT: A193GR. B7, NUT: A194 GR.2H, ASME B18.2.1/ASME18.2.2, 1 INCH	B7A	M16x80L		SET	191				
82	STUD BOLT	STUD BOLT, BOLT: A193GR. B7, NUT: A194 GR.2H, ASME B18.2.1/ASME18.2.2, 0.75 INCH	E7A	M20x115L		SET	106				
83	GASKET	GASKET, 4.5mm THK./300#, SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND VS OUTER RING, ASME B16.20, ASME 16.5, 12 INCH	B7A	300		NOS	14				
84	GASKET	GASKET, 4.5mm THK./300#, SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND VS OUTER RING, ASME B16.20, ASME 16.5, 8 INCH	B7A	200		NOS	24				
85	GASKET	GASKET, 4.5mm THK./600#, SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND VS OUTER RING, ASME B16.20, ASME 16.5, 6 INCH	D7A	150		NOS	18				
86	GASKET	GASKET, 4.5mm THK./300#, SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND VS OUTER RING, ASME B16.20, ASME 16.5, 6 INCH	B7A	150		NOS	6				
87	GASKET	GASKET, 4.5mm THK./300#, SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND VS OUTER RING, ASME B16.20, ASME 16.5, 4 INCH	B7A	100		NOS	11				
88	GASKET	GASKET, 4.5mm THK./600#, SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND VS OUTER RING, ASME B16.20, ASME 16.5, 3 INCH	D7A	80		NOS	9				
89	GASKET	GASKET, 4.5mm THK./300#, SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND VS OUTER RING, ASME B16.20, ASME 16.5, 3 INCH	B7A	80		NOS	5				
90	GASKET	GASKET, 4.5mm THK./600#, SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND VS OUTER RING, ASME B16.20, ASME 16.5, 2 INCH	D7A	50		NOS	4				
91	GASKET	GASKET, 4.5mm THK./600#, SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND VS OUTER RING, ASME B16.20, ASME 16.5, 1.5 INCH	D7A	40		NOS	4				
92	GASKET	GASKET, 4.5mm THK./600#, SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND VS OUTER RING, ASME B16.20, ASME 16.5, 1 INCH	D7A	25		NOS	14				
93	GASKET	GASKET, 4.5mm THK./300#, SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND VS OUTER RING, ASME B16.20, ASME 16.5, 1 INCH	B7A	25		NOS	44				
94	GASKET	GASKET, 4.5mm THK./900#, SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND VS OUTER RING, ASME B16.20, ASME 16.5, 0.75 INCH	E7A	20		NOS	27				
95	INSULATION	THERMAL INSULATION FOR 12" PIPE LINE ( 50 mm Thick Insulation)				M2	9				
96	INSULATION	THERMAL INSULATION FOR 8" PIPE LINE ( 50 mm Thick Insulation)				M2	36				
97	INSULATION	THERMAL INSULATION FOR 6" PIPE LINE ( 50 mm Thick Insulation)				M2	65				

- Notes:**
- 1 All pipes and pipe fittings must comply with Piping Material Specifications
  - 2 All Valve must comply with Valve Material Specifications
  - 3 The above quantities doesn't include construction contingency. Contractor to consider as required.
  - 4 Construction contractor to consider 100% spare gasket and 10% fasteners as spare in their offer.
  - 5 All materials shall be suitable for NACE service when in Hydrocarbon service
  - 6 An engineering contingency of 20% is considered and Contractor to consider Construction contingency as required.
  - 7 For Procurement and construction related notes refer to the attached SOW.
  - 8 Supply cost shall include supply of materials per specification along with MTC, transportation to site, unloading, storage, safe keeping and reconciliation of materials as required.
  - 9 Fabrication and testing cost should include welding, NDT, hydrotesting, Painting & preservation.



## SCHEDULE OF RATES - ELECTRICAL



DOC. NO: BHII-CPF-ELE-SOR-5025

CLIENT: SUN PETROCHEMICALS PVT LTD.

REV: 00

PROJECT NO: 23134




PROJECT: CENTRAL PROCESSING FACILITY AUGMENTATION



DATE: 05/10/2023

## CENTRAL PROCESSING FACILITY AUGMENTATION

### SCHEDULE OF RATES - ELECTRICAL



DOCUMENT NO: BHII-CPF-ELE-SOR-5025

					
0	05-10-2023	Issued for Approval	MM	KS	SPV
Rev	DATE	Purpose of Issue	Prepared by	Checked by	Approved by

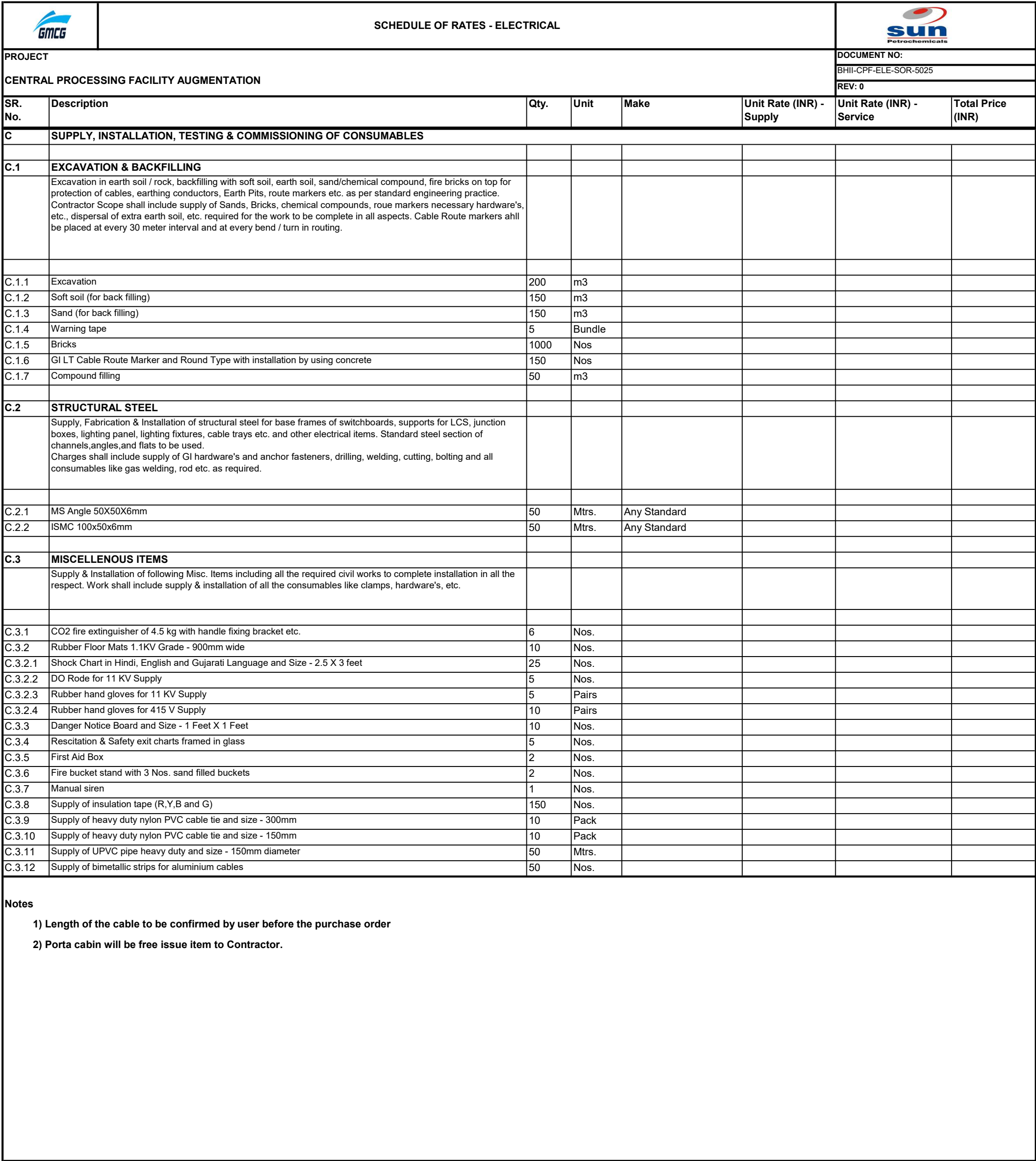
		SCHEDULE OF RATES - ELECTRICAL					
PROJECT  CENTRAL PROCESSING FACILITY AUGMENTATION						DOCUMENT NO:	
						BHII-CPF-ELE-SOR-5025	
						REV: 0	
SR. No.	Description	Qty.	Unit	Make	Unit Rate (INR) - Supply	Unit Rate (INR) - Service	Total Price (INR)
A	INSTALLATION, PRE-COMMISSIONING, TESTING & COMMISSIONING FOR PACKAGE ITEMS						
	Installation, Testing and Commissioning of Package Items. Work shall include receiving the items from SPPL Site store, transportation to installation site by transport vehicle, loading and unloading by crane etc., unpacking, fabrication of base frame, necessary framework, including grouting of the frame in wall, properly finishing civil work to match finished wall appearance, chipping of the wall / bolting / welding frame with supporting structure, supply of GI hardware's, erection, levelling, aligning, welding of base frame to inserts, mounting and fixing of all loose supplied accessories (if any) including foundation bolts, Placing of individual shipping sections on levelled base frame, bolting of individual shipping sections, Interconnection of wiring/busbar between individual shipping sections, Installation of exhaust gas pipe with stack (as per GPCB/CPCB Standards & Specs), etc., Drilling of required holes in gland plates, Inspection of physical damages and reporting of same to the Client, Gap sealing and vermin proofing of any unused cutouts and touch up painting, functional testing, carrying out acceptance tests and charging with necessary permissions. All work shall be carried out as per drawings and instructions of Engineer-in-charge. Contractor shall employ skilled and trained manpower for the work. All necessary mechanical tools and certified calibrated meters of required range and accuracy shall be arranged by the contractor. Performing necessary site acceptance tests and furnishing certificates for Client's approval shall be in Contractors scope.	-	-	-			
A.1	Supply and Installation of ACB in Existing PCC Panel	1	No.	L&T			
	Modification of existing PCC at backside of feeder F5 to suit The incomer Motor Operated ACB (Make- L&T) shall have provision for following protection such as overcurrent, short circuit, and earth fault / ground fault. It shall also include ON, OFF, TRIP, Spring charge, TCH and RYB indication. Also with CT, PT, Ammeter with ammeter selector switch (0-1250A) and Voltmeter with voltmeter selection switch (0-500V).						
A.2	Supply and Installation with Testing of MCC Panel Switch Board (Indoor & Floor Mounted) with Front Opening Only and Bus Bar on Top (Floor Mounted and Cable Entry from Bottom)	1	No.				
A.2.1	MCC-1 Panel Details: 1) Copper Bus Bar Rating - 415V, 50 Hz, 1600A, 3 Ph. 2) SC Level - 50 kA for 1 sec						
A.2.2	Bus Bar Rating -CU, 415V, 50 Hz, 1250 Amps, 3 Ph. + Neutral						
A.2.3	SC Level - 36KA for 1 sec.						
A.2.4	The switchboard also includes the CTs, metering accessories complete in all respects.						
A.2.5	Incomer - 1250 Amps, 4P Motor Operated ACB shall have provision for following protection such as overcurrent, short circuit, and earth fault / ground fault. It shall also include ON, OFF, TRIP, Spring charge, TCH and RYB indication. Including Multifunction with CT.	1	No.	L&T			
A.2.6	Outgoing feeders						
A.2.7	MCCB with earth fault protection - 630 4P with VFDs Heavy duty (Model - FX2000) for 160 KW Motors.	2	Nos.	L&T			
A.2.8	MCCB with earth fault protection - 400 4P with Soft starters Heavy duty (Model - EMX3) for 132kW motors.	2	Nos.	L&T			
A.2.9	63 A 4P RCBO.	4	Nos.	L&T			
A.2.10	DOL starter - 0.75 KW for MOV.	5	Nos.	L&T			
A.2.11	DOL starter - 0.37 KW for motors.	8	Nos.	L&T			
A.2.12	DOL starter - 3.7 KW for seal pump.	4	Nos.	L&T			
A.2.13	DOL starter - 5.5 KW for motors.	4	Nos.	L&T			
A.2.14	DOL starter - 11 KW for motors.	4	Nos.	L&T			
A.2.15	Star-delta starter for 22 KW Motor.	2	Nos.	L&T			
A.2.16	32A 4P RCBO for power feeder.	5	Nos.	L&T			
A.2.17	250A 4P MCCB with earth fault protection for power feeder.	2	Nos.	L&T			
A.2.18	400A 4P MCCB with earth fault protection for power feeder.	2	Nos.	L&T			
A.2.19	630A 4P MCCB with earth fault protection for power feeder.	1	No.	L&T			
A.2.20	All DOL starter feeders shall have ON, OFF, trip indication, Start and stop push button and L/R selector switch. All power feeders shall have ON, OFF and trip indication. All outgoing feeders shall have CBCT with ELR.						
A.2.21	Separate cabinet for marshalling for indication of Local/Remote, run, trip, stop, start through DCS and the panel shall be of single front type.						
A.3	Lighting Transformer	1	No.	ABB / Volt amp			
	Supply and Installation with Testing of 25KVA lighting transformer with 415 V (Ph-Ph) / 240 V (Ph-Ph) and neutral midpoint earthed and shall be designed with proper ventilation and suitable power cable termination for incoming and outgoing connection with earth fault protection.						
A.4	Heat tracing panel	1	No.	Recommended Vendor - Vedee Associates			
	Supply, installation and testing of heat tracing panel and materials including heat tracer cable, insulation, required accessories etc. 1) Incomer - 1 No. of 160A 4P MCCB and Make - L&T 2) Outgoing - 16 Nos. 40A DP RCBO (Make - L&T) with contractor (Make - L&T) including indicator cum "ON/OFF" type temperature controller (Make - Select)						
1	Supply of 'Eltherm' Germany Make ELSR-H-60 Heating Cable For Pipe line	Mtrs	95	Elthern			
2	FLP power connector	Nos.	4	Sudhir/FCG			
3	FLP end connector	Nos.	8	Sudhir/FCG			
4	FLP Tee connector	Nos.	3	Sudhir/FCG			
5	RTD - PT 100	Nos.	4	Altop/Kayson			
6	Mounting Bracket	Nos.	19				
7	SS Pipe Strap of various sizes	Nos.	42				
8	Aluminium adhesive tape	Roll	5	CGAL			
9	Glass adhesive tape	Roll	20	CGAL			
10	Warning label	Nos.	12				
A.5	Porta cabin (Note 2)	0	No.				
	Supply of porta cabin with suitable thermal insulation for electrical installation with 4 Nos. of 1.5 Ton AC. Porta cabin size shall be 30 feet (L) x 10 feet (W) x 8.5 feet (H) for installation of PMCC panel.	0	No.				

		SCHEDULE OF RATES - ELECTRICAL						
PROJECT  CENTRAL PROCESSING FACILITY AUGMENTATION							DOCUMENT NO:	
							BHII-CPF-ELE-SOR-5025	
							REV: 0	
SR. No.	Description	Qty.	Unit	Make	Unit Rate (INR) - Supply	Unit Rate (INR) - Service	Total Price (INR)	
B	SUPPLY, INSTALLATION, TESTING & COMMISSIONING FOR BULK ITEMS							
	Supply, Installation, Testing and Commissioning of Bulk Items as per standards & best engineering practice. Supply shall include Factory acceptance tests (as required) & certificates. All the supplied items shall be of reputed or Client approved makes, state of the art quality, durable, without any damages, perfect finishing, without visual damages, including all the required accessories, hardware consumables, etc. and complete in all respect. Work shall include receiving the items from SPPL Site store, transportation to installation site by transport vehicle, loading and unloading by crane etc., unpacking, necessary fabrication, framework, grouting, properly finishing civil work, chipping of the wall / bolting / welding, supply of GI hardware's & consumables, erection, mounting and fixing of all loose supplied accessories (if any), wiring, Drilling of required holes in gland plates, Preparing concrete foundation of required size & depth for poles along with all the necessary arrangement for pipe sleeves (for cabling), anchor bolts, excavation, disposal of surplus earth, backfilling with sand soil, bricks, route markers, etc. as per standards along with supply of cement, sand and other related item for preparing concrete foundations. Inspection of physical damages and reporting of same to the Client, Gap sealing and vermin proofing of any unused cutouts and touch up painting, functional testing, carrying out acceptance tests and charging with necessary permissions. All work shall be carried out as per drawings and instructions of Engineer-in-charge. Contractor shall employ skilled and trained manpower for the work. All necessary mechanical tools and certified calibrated meters of required range and accuracy shall be arranged by the contractor. Performing necessary site acceptance tests and furnishing certificates for Client's approval shall be in Contractors scope.							
B.1	LIGHTING FIXTURES - (Integral / Non-Integral type) along with diffusers, reflectors & all other mounting accessories.							
B.1.1	Industrial Lighting Fixtures - Flameproof type							
B.1.1.1	60W LED Well glass Lighting Fixture.	10	Nos.	Any Standard				
B.2	RECEPTACLES / SOCKET OUTLETS & SWITCH BOXES							
B.2.1	Receptacles (Socket outlets with Plugs) - Industrial type							
B.2.1.1	16A, 1 Ph. 3-Pin Socket Outlet - Flameproof & Wall / Column Mounted	1	Nos.	Any Standard				
B.2.1.2	32A, 3 Ph. 5-Pin Socket Outlet - Flameproof & Wall / Column Mounted	1	Nos.	Any Standard				
B.3	EARTH ELECTRODES / PITS							
	Supply, installation, testing and commissioning of chemically treated earth pit having following sizes of electrodes. Supply shall include backfill chemical compound, fixing clamps, link plates, etc.. Work shall include excavation, driving electrode in to ground, back filling with backfill chemical compound, construction of brick chamber, removable RCC / CI cover with lifting arrangement, fixing of clamps, link plates, termination & connection, marking of earth pit no. etc., testing & commissioning as per Specifications / standards / instructions of Engineer-in-charge.							
B.3.1	3000mm long & 65mm dia. GI pipe electrode	12	Nos.					
B.4	EARTHING CONDUCTOR							
	Supply, laying, installation & termination of earthing conductors of following sizes. The earthing conductors shall be buried in ground, laid on trays, trenches, pipe sleeves, etc. as shown in earthing layouts for different areas of the overall plot. Work shall include excavation (wherever required), laying of conductor, back filling with sand / tiles/ brick / soil as shown in layouts, termination / welding connection, etc. all under supervision of site Engineer-in-charge. Work shall also include re-routing of Earthing Conductors as per actual site conditions in presence and under instructions of Engineer-in-charge. Excavation shall be considered separately in this BOQ.							
B.4.1	GI Strip Hot Deep Galvanised and Coating Thickness - 70 Micron							
B.4.1.1	50x6 mm	250	Mtrs.	Any Standard				
B.4.2	Copper Wire (green/yellow coloured PVC insulated, Unarmoured, Flexible Cu. Cable)							
B.4.2.1	1C x 6 Sq.mm.	100	Mtrs.	Finola/RR				
B.4.2.2	1C x 35 Sq.mm.	100	Mtrs.	Finolex/RR				
B.5	EARTH BUS							
	Supply, installation & termination of earthing bus of following sizes & specifications. Supply shall include fixing bolts, other required accessories, consumable hardware's, etc. The earth buses shall be mounted on walls, columns, floor, equipment foundations, etc. as shown in earthing layouts for different areas of the overall plot. Work shall include mounting, fixing / bolting of earth bus, welding (if required), etc. all under supervision of site Engineer-in-charge. Work shall also include re-locating of Earthing buses as per actual site conditions in presence and under instructions of Engineer-in-charge.							
B.5.1	300mm x 50mm x 6 mm GI Earth Bus with 8 Holes of 10mm dia. each	12	Nos.	Any Standard				
B.6	LIGHTNING PROTECTION SYSTEM							
	Supply, installation & termination of Lightning Protection system consisting of following air terminals & test links. Down conductors are considered separately in earthing conductors. Supply shall include fixing bolts, other required accessories, consumable hardware's, etc. The air terminal shall be mounted on top of structure / building as shown in earthing layouts for different areas of the overall plot. Test links shall be mounted on wall / column / trench for every down conductor as shown in layouts. Work shall include mounting of air terminal, fixing / bolting of test links, welding (if required), etc. all under supervision of site Engineer-in-charge. Work shall also include re-locating of air terminals & test links as per actual site conditions in presence and under instructions of Engineer-in-charge.							
B.6.1	1.5 Mtr. Long copper Air Terminal Rod	4	Nos.					
B.6.2	Test Link	4	Nos.					



		SCHEDULE OF RATES - ELECTRICAL					
PROJECT  CENTRAL PROCESSING FACILITY AUGMENTATION						DOCUMENT NO:	
						BHII-CPF-ELE-SOR-5025	
						REV: 0	
SR. No.	Description	Qty.	Unit	Make	Unit Rate (INR) - Supply	Unit Rate (INR) - Service	Total Price (INR)
B.7	CABLES						
	Supply, laying, installation and termination of following sizes of cables in cable trays/trenches/directly buried underground including spacers and saddles as required. Work shall include taking measurement cutting to required length after comparing with cable schedule, drum schedule preparation, supply and fixing of GI clamps, GI spacers and saddles. Cable shall be clamped at a distance of 800 mm horizontal laying and 300 mm in vertical laying. Cables shall be clamped by nylon wire in cable trays. Work also includes installation of cable route markers (HT/LT) for buried cables at every 30 mtr intervals & at every turning of route. Cables shall not be bent beyond the acceptable limits as per standards. Supply rate for route markers are considered separately in this BOQ.						
B.7.1	1.1KV , XLPE Insulated, CU. Conductor, FRLS Double Round Armoured Cables						
B.7.1.1	3C x 2.5 SQ. MM. (2XWY)	2000	Mtrs.	Polycab/KEI			
B.7.1.2	4C x 2.5 SQ. MM. (2XWY)	10000	Mtrs.	Polycab/KEI			
B.7.1.3	8C x 2.5 SQ. MM. (2XWY)	3000	Mtrs.	Polycab/KEI			
B.7.1.4	12C x 2.5 SQ. MM. (2XWY)	1500	Mtrs.	Polycab/KEI			
B.7.1.5	4C x 4 SQ. MM. (2XWY)	1000	Mtrs.	Polycab/KEI			
B.7.1.6	4C x 6 SQ. MM. (2XWY)	2000	Mtrs.	Polycab/KEI			
B.7.2	1.1KV , XLPE Insulated, AL. Conductor, FRLS Double Armoured Cables						
B.7.2.1	3.5C x 185 SQ. MM. (A2XFY)	2500	Mtrs.	Polycab/KEI			
B.7.2.2	3.5C x 400 SQ. MM. (A2XFY)	200	Mtrs.	Polycab/KEI			
B.7.3	Double Compression, Flameproof type Cable glands for 1.1KV grade XLPE/PVC FRLS cables						
B.7.3.1	3C x 2.5 SQ. MM.	100	Nos.	HMI			
B.7.3.2	4C x 2.5 SQ. MM.	100	Nos.	HMI			
B.7.3.3	8C x 2.5 SQ. MM.	30	Nos.	HMI			
B.7.3.4	12C x 2.5 SQ. MM.	12	Nos.	HMI			
B.7.3.5	4C x 4 SQ. MM.	12	Nos.	HMI			
B.7.3.6	3.5C x 185 SQ. MM.	22	Nos.	HMI			
B.7.3.7	3.5C x 400 SQ. MM.	5	Nos.	HMI			
B.7.3.8	4C X 6 SQ. MM.	12	Nos.	HMI			
B.7.4	Copper lugs for 1.1KV grade XLPE/PVC FRLS cables						
B.7.3.1	3C x 2.5 SQ. MM - Ring Type	400	Nos.	HMI			
B.7.3.2	4C x 2.5 SQ. MM - Ring Type	400	Nos.	HMI			
B.7.3.3	8C x 2.5 SQ. MM - Pin Type	300	Nos.	HMI			
B.7.3.4	12C x 2.5 SQ. MM - Pin Type	160	Nos.	HMI			
B.7.3.5	4C x 4 SQ. MM - Pin Type	60	Nos.	HMI			
B.7.3.8	4C X 6 SQ. MM - Ring Type	60	Nos.	HMI			
B.7.5	Aluminium lugs for 1.1KV grade XLPE/PVC FRLS cables						
B.7.3.6	3.5C x 185 SQ. MM - Ring Type	100	Nos.	HMI			
B.7.3.7	3.5C x 400 SQ. MM - Ring Type	20	Nos.	HMI			
	Supply, installation, Testing and commissioning of following types of local control stations. Work shall include fixing on wall/structure using GI bolts, nuts and washers, rawal plugs etc. including all labour and hardware as per drawings specifications and instruction of engineer in-charge. (Supply & fabrication of steel wherever required will be paid separately under relevant items.)						
B.8.1	Industrial, Weatherproof type LCS - for Hazardous Area						
B.8.1.1	LCS with Start & Stop push buttons and ON/OFF indication.	15	Nos.	Any Standard			
B.8.1.2	LCS with Start & Stop push buttons, ON/OFF indication and Digital Ammeter	4	Nos.	Any Standard			
B.9	CABLE TRAYS, BENDS, 'T' JOINTS & REDUCERS						
	Supply, installation of GI Perforated/Ladder type cable trays with GI covers (for outdoor areas) and accessories such as coupler plates, hardware, bends, reducers, 'T' joints, cross, other required accessories, consumable hardware's, etc. as per the direction of site in charge. Work shall include levelling and fixing with cable tray supports. The cable tray shall be installed on pipe racks/or on cable trays supports provided below room or on trench wall / column as required. Cable tray shall be earthed (connected to earthing strip) at every 30 mtr interval. Cable Trays shall be supported at every 1M Interval.						
B.9.1	GI Perforated Cable Trays						
B.9.1.1	50 mm wide GI Perforated type cable tray and thickness - 2mm with Cover	150	Mtrs.	Sumip/Satyam/Aeron			
B.9.1.2	100 mm wide GI Perforated type cable tray and thickness - 2mm with Cover	100	Mtrs.	Sumip/Satyam/Aeron			
B.9.1.3	450 mm wide GI Ladder type cable tray and thickness - 2mm	350	Mtrs.	Sumip/Satyam/Aeron			
B.9.1.4	750 mm wide GI Ladder type cable tray and thickness - 2mm	350	Mtrs.	Sumip/Satyam/Aeron			
B.9.2	Bends						
B.9.2.1	450 mm wide Ladder Vertical 90 degree bend Inside	15	Nos.	Sumip/Satyam/Aeron			
B.9.2.2	450 mm wide Ladder Vertical 90 degree bend Outside	15	Nos.	Sumip/Satyam/Aeron			
B.9.2.3	750 mm wide Ladder Vertical 90 degree bend Inside	15	Nos.	Sumip/Satyam/Aeron			
B.9.2.4	750 mm wide Ladder Vertical 90 degree bend Outside	15	Nos.	Sumip/Satyam/Aeron			







## SCHEDULE OF RATES - INSTRUMENTATION






DOC. NO: BHII-CPF-INI-SOR-6033	CLIENT: SUN PETROCHEMICALS PVT LTD.	REV: 00
PROJECT NO: 23134	PROJECT: CENTRAL PROCESSING FACILITY AUGMENTATION	DATE: 05/10/2023

## CENTRAL PROCESSING FACILITY AUGMENTATION

### SCHEDULE OF RATES - INSTRUMENTATION

DOCUMENT NO: BHII-CPF-INI-SOR-6033

					
0	05-10-2023	Issued for Approval	MM	KS	SPV
Rev	DATE	Purpose of Issue	Prepared by	Checked by	Approved by



## SCHEDULE OF RATES - INSTRUMENTATION



## PROJECT

## DOCUMENT NO:

## CENTRAL PROCESSING FACILITY AUGMENTATION



BHIL-CPF-INI-SOR-6033

REV: 0

Sr. No.	Description	Qty.	Unit	Make	Unit Rate (INR) - Supply	Unit Rate (INR) - Service	Total Price (INR)
A	Supply, testing, transport and installation of Instruments including handling, shifting from site-store/yard to the installation location, required hardware/fasteners, accessories, consumables,tagging etc.,						
1.1	D.P type transmitter	8	Nos.	Rosemount/Endress Hauser			
1.2	Pressure gauge	4	Nos.	General			
1.3	Flame detector	2	Nos.	MSA Safety / Honeywell			
1.4	Motor operated valves - Free issue	4	Nos.	-	-		
1.5	Safety valves	3	Nos.	Brightech			
1.6	Control valves - Free issue	4	Nos.	-	-		
1.7	FTs	7	Nos.	Rosemount			
1.8	Orifice	2	Nos.	Precision / Emerson			
B	Calibration / refurbishment charges including handling, shifting from site-store / yard to the installation location, restore to safe place after calibration, removable and reinstallation from/to package units, if required, require tools & tackles, manpower, calibrators, calibration laboratory, changing range / engg. unit etc. as per data sheet, trouble shooting, preparation of reports, hardware/fasteners, consumables, Labelling (with range, date, tag), etc. all complete as per specification						
1.1	D.P type transmitter	8	Nos.	-			
1.2	Pressure gauge - Dia seal type, 2" Flanged conn.	4	Nos.	-			
1.3	Flame detector	2	Nos.	-			
1.4	Motor operated valve	4	Nos.	-			
1.5	DCS configuration, Development of graphics and testing	1	LOT	-			
1.6	Cause and effects checking	1	LOT	-			
1.7	Loop checking for field instruments	94	Nos.	-			
a	digital input / outputs	32	Nos.	-			
b	Analog input / outputs	16	Nos.	-			
c	Loop checking for MCC digital inputs/outputs	46	Nos.	-			
1.8	Safety valves	3	Nos.	-			
1.9	Control valves	4	Nos.	-			
1.10	Flow transmitters	7	Nos.	-			
1.11	Temperature transmitters	4	Nos.	-			
C	Supply and laying of Armour cables						
1.1	Supply & laying of Armour cables						
1.1.1	1P x 1.0 mm2, Shielded Signal cable for AI/AO	50	Meters				
1.1.2	6P x 1.0 mm2,Shielded(ind &Overall)Signal cable for AI/AO	50	Meters				
1.1.3	12Px1.0 mm2,Shielded(ind &Overall)Signal cable for AI/AO	50	Meters				
1.1.4	1P x 1.0 mm2, Shielded Alarm cable for DI	50	Meters				
1.1.5	2P x 1.0 mm2, Shielded (Overall) Alarm cable for DI	150	Meters				
1.1.6	6P x 1.0 mm2, Shielded (Overall) Alarm cable for DI	100	Meters				
1.1.7	12P x 1.0 mm2, Shielded (Overall) Alarm cable for DI	500	Meters				
1.1.8	2C x 1.5 mm2, Control Cable for DO	50	Meters	Polycab/KEI			
1.1.9	12C x 1.5 mm2, Control Cable for DO/POWER	50	Meters				
1.1.10	24C x 1.5 mm2, Control Cable for DO/ POWER	1200	Meters				
1.1.11	3Cx 1.5 mm2, Power Cable	50	Meters				
1.1.12	3C x 2.5 mm2, Power Cable	50	Meters				
1.1.13	1T X 1.5 mm2 RTD cable	50	Meters				
1.1.14	1T X 1.5 mm2 GD cable	50	Meters				
1.1.15	8T X 1.5 mm2 GD cable	50	Meters				
1.2	Earthing cables PVC insulated Type 'C' - 85 °C as per IS 5831-1994 multi-stranded copper conductor wire in green colour						
1.2.1	1 x 2.5 MM2 multistrand copper cable, PVC insulated	300	Meters	Polycab/KEI			
1.2.2	1 x 6 MM2 multistrand copper cable, PVC insulated	200	Meters				
1.3	Cable glanding and termination with PVC hood						
	Includes glanding, ferruling ,lugging ,termination ,continuity checks for point to point wiring termination with supply of printed ferrules, Lugs, PVC tapes,PVC/Nylon cable tie,PVC sleeves for DC type cable glands						
1.3.1	size: 1 1/4"NPT x 12Px1 mm2 cable for AI/AO/DI	5	Nos.				
1.3.2	size: 1 " NPT x 6Px1 mm2 cable for AI/AO/DI	5	Nos.				
1.3.3	size: 1 "NPT x 12Cx1.5 mm2 cable for DO	5	Nos.				
1.3.4	size: 1 1/2"NPT x 24Cx1.5 mm2 cable for DO	5	Nos.				
1.3.5	size: 1/2" NPTx 1Px1.0 mm2 cable for AI/AO/DI	5	Nos.				
1.3.6	size: 1/2" NPTx 2Px1.0 mm2 cable for DI	5	Nos.				
1.3.7	size: 1/2" NPTx 1Tx1.5 mm2 cable for RTD/GD	5	Nos.				
1.3.8	size: 1/2" NPTx 2Cx1.5 mm2 cable for power	5	Nos.				
1.3.9	size: 1/2" NPTx 3Cx1.5 mm2 cable for power	5	Nos.				
1.3.10	size: 1/2" NPTx 3Cx2.5 mm2 cable for power	5	Nos.	Standard			
1.3.11	size: 3/4" ETx 1Px1.0 mm2 cable with check nut	5	Nos.				
1.3.12	size: 3/4" ETx 2Cx1.5 mm2 cable with check nut	5	Nos.				
1.3.13	size: 3/4" ETx 3Cx1.5 mm2 cable with check nut	5	Nos.				
1.3.14	size: 3/4"ET x 3Cx2.5 mm2 cable with check nut	5	Nos.				
1.3.15	size: 1 1/4"ET x 12Px1.0 mm2 cable with check nut	5	Nos.				
1.3.16	size: 1 "ET x 6Px1.0 mm2 cable with check nut	5	Nos.				
1.3.17	size: 1 1/2"ET x 24Cx1.5 mm2 cable with check nut	15	Nos.				
1.3.18	size: 1 "ET x 12Cx1.5 mm2 cable with check nut	5	Nos.				

1.4	Supply of Die-cast Al Junction boxes IP-65 & flameproof to Ex'd' / Exe					
1.4.1	Supply of Junction Box with 40 Terminals -Approx size: 350mm (W) x 350mm (H) x150mm (D)	5	Nos.	Standard		
	<b>Fabrication &amp; Erection of Ladder / Perforated GI Cable Tray including fabrication of bends, reducers, Tees and including supply of mounting SS.fastners ( nut&amp;bolts)</b>					
1.5.1	Perforated type, 2.0 mmthick					
	50 mm wide x 50 mm Height	120	Meters	Standard		
	100 mm wide x 50 mm Height	60	Meters			
	150 mm wide x 50 mm Height	90	Meters			
	300 mm wide x 50 mm Height	300	Meters			
1.6	<b>Fabrication, Erection . Surface cleanning &amp; epoxy Painting of structural Steel like Angle, Channels Flats, Plate. for support of Cable Trays, Panels, JB, Air Manifold &amp; Field Inst.</b>					
1.6.1	ANGLE ISA 50 X 50 X 6 mm Thk	250	Kgs	Standard		
1.6.2	CHANNEL ISMC 100 x 50 x6mm	250	Kgs			
1.6.3	Anchor fastner 12 MM X100 L	60	Nos.			
1.6.4	Anchor fastner 10 MM X100 L	120	Nos.			
1.7	<b>Fabrication, Installation , surface cleanning &amp; epoxy Painting of 2" Instrument Stand Pipe (Stanchion support) including supply of 4 nos of anchor fastners. Pipe shall be 2" size IS :1239 hvy duty.</b>	5	Nos.			
1.8	<b>Supply of tube fittings and Mislaneous items</b>					
1.9	<b>Transparent Tubes</b>					
1.9.1	1/2" OD PVC tube Transparent, Max working Pressure : 150 PSI	5	Meters	Standard		
1.9.2	1/4" OD PVC tube Transparent, Max working Pressure : 150 PSI	5	Meters			
1.9.3	3/8"OD PVC tube Transparent, Max working Pressure : 150 PSI	5	Meters			
1.9.4	<b>SS 316 Tubes.</b>					
2	Tube specification : • All stainless tubing shall be of SS316 seamless, bright finished, soft annealed as per ASTM A269 and to be supplied in 6-meter length, • All tubes shall be scratch free and suitable for bending.					
2.1	1/2", O.D. SS tube ( Seamless) SS-316 (wall thickness 0.049" ), MOC-316	5	Meters			
3	<b>Tubes fittings - Double compression type , &amp; Fitting materials, MOC- SS316</b>					
3.1	Cap( Nut) and Ferrule; 1/2" OD, MOC - SS316	5	Nos.	Standard		
3.2	Tube Union - Straight; 1/2" OD x 1/2"OD	5	Nos.			
3.3	Tube Union; 1/2"OD x 1/2" OD "L" type	5	Nos.			
3.4	Tube Male Connector; 1/2" NPT (M)x 1/2" O.D.	5	Nos.			
3.5	Tube Male elbow Connector; 1/2"NPT(M) x 1/2" OD "L" type	5	Nos.			
3.6	Tube Female Connector; 1/2"NPT (F)x 1/2" OD	5	Nos.			
3.7	Tube Union tee ; 1/2"OD x 1/2" OD, Equal "T" type	5	Nos.			
3.8	Tube Male Connector; 1/2" NPT (M)x 6mm OD with stainless steel cap(nut) and copper	5	Nos.			
3.9	Tube Male Connector ;1/2" NPT (M) x 3/8 inch O.D.	5	Nos.			
3.10	1/2"x1/2"Female NPT Needle Valve, SS316,	5	Nos.			
3.11	1/2"Male NPT X1/2" Female NPT angle Needle valve,	5	Nos.			
3.12	1/2"Male NPTx1/2"Female NPT Ball Valve,	5	Nos.			
3.13	Nipple; Hex, 1/2" Male NPT x 6" long,	5	Nos.			
3.14	Nipple; Hex., 1/2" Male NPT x 2" long, MOC-SS316,	5	Nos.			
3.15	Nipple; Hex, 1/2" NPT Male x 3" long, MOC-SS316,	5	Nos.			
3.16	Nipple; Hex, 1/2" NPT Male x 4" long, MOC-SS316,	5	Nos.			
3.17	Valve - Ball; 1/2"NPT(F) x 1/2" NPT(F),	5	Nos.			
3.18	Valve - Needle, 1/2" NPT Male x 1/2" NPT Female,	5	Nos.			
3.19	Plug - Blind; 1/2" Male NPT, MOC-SS316	5	Nos.			
3.20	Equal Tee 1/2"ODX 1/2"ODX 1/2"OD	5	Nos.			
4	<b>Valve Manifold for Pressure &amp; DP transmitters</b>					
	Manifold - 5 way; Coplanar design type, Process connection: 1/2" NPT(F) x Transmitter housing end with 1/4" NPT(F) drain point both side with 1/4" NPT (M)blind plug, Type of	12	Nos.	Standard		
4.1	Transmitter: for differential pressure transmitter with mounting studs					
	<b>Instrument general consumables( additional items - not to be part of cable laying 5 , tubing work shall be supplied as spares )</b>					
5.1	Teflon Tape, Size: 1/2"	20	Nos.	Standard		
5.2	Terminals fork type 0.5 mm2 with soldered seam and easy-entry insulation	20	Nos.			
5.3	Terminals fork type 1 mm2 with soldered seam and easy-entry insulation	20	Nos.			
5.4	Terminals fork type 1.5 mm2 with soldered seam and easy-entry insulation	20	Nos.			
5.5	Pin cable lugs 0.5 mm2 DIN 46231with soldered seam and easy-entry insulation	20	Nos.			
5.6	Pin cable lugs 1 mm2 DIN 46231with soldered seam and easy-entry insulation	20	Nos.			
5.7	Pin cable lugs 1.5 mm2 DIN 46231with soldered seam and easy-entry insulation	20	Nos.			
5.8	Tube-shape Copper Cord end terminals/Cable lugs 0.5 mm2	20	Nos.			
5.9	Tube-shape Copper Cord end terminals/Cable lugs 1 mm2	20	Nos.			
5.10	Tube-shape Copper Cord end terminals/Cable lugs 1.5 mm2	20	Nos.			
5.11	Tube-shape Copper Cord end terminals/Cable lugs twin entry 0.5 mm2	20	Nos.			

Responsibility Matrix				
Sr. No.	Deliverable / Activity Description	Contractor	SunPetro	Remarks
01	Preparation of activity wise program of work conforming to agreed Completion schedule.	√		
02	Submission of QAP & ITP	√		
03	Setting up of Contractor's Site Office with computing and printing facilities and fabrication, inspection & storage facilities	√		
04	Deployment of adequate number of qualified & experienced manpower, skilled/unskilled manpower at site for executing the work within agreed Completion schedule. Resume of persons to be submitted for approval by Company.	√		
05	Providing all construction equipment and machinery including welding machinery, all materials required for fabrication and erection of the complete work including sand, cement, reinforcement rods, consumables, tools & tackles, instruments, test equipment of reputed make for execution of work.	√		
06	Providing all material handling equipment, tools & tackles along with load test certificates.	√		
07	Providing personal protective equipment for Contractor's manpower according to statutory requirements	√		
08	Providing adequate number of transport vehicles for movement of contractor's working personnel.	√		
09	Transport and Receipt of all materials (including free issue) at contractor's storage.	√		
10	Transport of free issue materials from company's storage/ site locations to erection site.	√		
11	Transportation of material from Contractor's fabrication shop/storage to erection site.	√		
12	Submission of WPS, PQR & Welder Qualification certificates and any other document required for execution of quality work.			
	1. Residual engineering for piping works and erection works.	√		
	2. Preparation of all engineering drawings/ documents, including drawings/documents required for statutory approvals, design calculations, specifications, bill of materials, and all erection procedures	√		
	3. As Built drawings and documents.	√		
17	Inspection of all bought out items and free issue items at site/	√		
18	Inspection of the works carried out by contractor at fabrication shop /	√	√	
19	Quantifying, monitoring and reporting of actual progress of work, scheduling and forecasting.	√		
20	Removal of all kinds of contractor's debris from construction site	√		
21	Disposal of excess earth from excavation work as instructed by company	√		
22	Disposal of hydrostatic test water as instructed by company	√		
23	Providing Food and Accommodation for Contractor's personnel	√		
24	Supply of Utilities like air, water, oil and electric/diesel power	√		
25	Insurance of Contractor's men & material	√		
26	Following Company's HSE policy, safety rules	√		
27	Following safety requirements of Oil & Gas Industry & as instructed by site In-charge.	√		

	SUGGESTED VENDORS LIST	
DOC. NO: -	CLIENT: SUN PETROCHEMICALS PVT LTD	-
PROJECT NO: 23134	PROJECT: CENTRAL PROCESSING FACILITY AUGMENTATION	REV: 00

# SUGGESTED VENDORS LIST

00	23/09/2023	ISSUED FOR REVIEW	SSK	MN	CDN
REV	DATE	PURPOSE	PREPARED BY	CHECKED BY	APPROVED BY

INDEX	
1	MECHANICAL/PROCESS
2	PIPING
3	INSTRUMENTATION
4	ELECTRICAL
5	PIPELINE
6	CIVIL
7	GENERAL



## **MECHANICAL/ PROCESS**

S. No.	EQUIPMENT		INDIGENOUS / FOREIGN	REMARKS
<b>1</b>	<b>HDPE TANK</b>			
	M/s	SINTEX		
	M/s	BHAVI PLAST PVT. LTD., MUMBAI		
	M/s	PRANITA ENTERPRISES, MUMBAI (or Any Other BIS Approved Make)		
<b>2</b>	<b>STRAINER (FAB/ CAST/ FORGED)</b>			
	M/s	J.N. MARSHAL & CO.		
	M/s	OTOKLIN FILTERS OF INDIA LTD.		
	M/s	GREAVES COTTON & CO.		
	M/s	MAZDA POWER ENGINEERS		
	M/s	VARALL ENGINEERS		
	M/s	UDKAM PROCESS EQUIPMENT INDIA PVT LTD		1. Dia upto 18 inch NB, Class 150#, Fabricated type 2. Dia upto 10 inch NB, Class 600#, Fabricated type
<b>3</b>	<b>CS PLATE</b>			
	M/s	TISCO		
	M/s	SAIL		
	M/s	JINDAL STEEL		
	M/s	ESSAR STEEL		
<b>4</b>	<b>FIRE FIGHTING SYSTEM</b>			
	M/s	MATHER & PLATT FIRE SYSTEMS LTD.		
	M/s	VIJAY FIRE PROTECTION SYSTEM LTD.		
	M/s	VIMAL FIRE CONTROL PVT. LTD.		
	M/s	NITIN FIRE PROTECTION INDUSTRIES LTD.		
	M/s	STEELAGE INDUSTRIES LTD.		
	M/s	NEW AGE FIRE FIGHTING CO. LTD, SURENDRANAGAR	For HVLR (Remote and Manual) for up to 4000 GPM	
	M/s	FIRETECH EQUIPMENT & SYSTEMS PVT. LTD., MUMBAI	Only for Foam Chamber and Foam Maker.	
	M/s	HD FIRE PROTECT PVT. LTD.	UL listed/FM approved Water cum Foam Monitors . Water Monitors Foam Equipment/Foam systemItems.	
	M/s	SHAH BHOGILAL JETHALAL & BROS	Water cum Foam Monitor( UL Listed), Water Monitor, Medium Expansion Foam Generator (UL Listed),	

			Long Range Monitor (HVLR) up to 2000 GPM UL listed Remote Controlled monitors up to 2000 GPM UL listed Fire hose accessories and hydrant system including landing valves, Foam Equipment/Foam system Items.	
<b>5</b>	<b>ROTARY POSITIVE DISPLACEMENT PUMP</b>			
	M/s	ALLWEILER INDIA PVT LTD,DAMAN		
	M/s	ROTO PUMPS PVT. LTD, DELHI		
	M/s	MAAG		
	M/s	ALBANY		
	M/s	VIKING		
	M/s	HAYWARD TAYLER		
	M/s	SHOTHERT & PITT		
	M/s	SEEPEX GmbH, GERMANY (Through Seepex India Pvt Ltd)		
	M/s	Borger GmbH, Germany		
<b>6</b>	<b>PUMP-ROTARY.SCREW</b>			
	M/s	NETZCH TECHNOLOGIES INDIA PVT LTD	INDIA	UP TO 20 M3 /HR AND 12 KG/CM2 PR
	M/s	ALEKTON ENGG INDUSTRIES PVT LIMITED	INDIA	
	M/s	ROTO PUMPS PVT LTD	INDIA	
	M/s	TUSHACO PUMPS LTD	INDIA	
	M/s	UT PUMPS & SYSTEMS PVT LTD	INDIA	
	M/s	ALLWEILER AG	FOREIGN	
	M/s	BORNMANN PUMPEN	FOREIGN	NOT FOR TRIPLE SCREW PUMP
	M/s	FLOWSERVE CORPORATION (FORMERLY I571)	FOREIGN	
	M/s	IMO AB.	FOREIGN	
	M/s	IMO INDUSTRIES INC (USA)	FOREIGN	
	M/s	LEISTRITZ AG	FOREIGN	
	M/s	PLENTY MIRRLESS PUMPS	FOREIGN	
	M/s	POMPE VERGANI SPA	FOREIGN	
	M/s	WARREN PUMPS INC	FOREIGN	ONLY FOR TWIN SCREW TYPE

	M/s	ALEKTON ENGG INDUSTRIES PVT LTD	FOREIGN	UPTO 36CU.MTR/HR AT 40KG/CM2 PR. AND 100 DEG TEMP
	M/s	ROTO PUMP LTD	FOREIGN	SINGLE AND TWIN SCREW PUMPS
	M/s	TUSHACO PUMP PVT LTD	FOREIGN	
	M/s	UT PUMPS AND SYSTEMS PVT LTD	FOREIGN	UPTO 75 KW
<b>7</b>	<b>PRESSURE FILTER</b>			
	M/s	ION EXCHANGE, INDIA		
	M/s	ARUDRA, INDIA		
	M/s	LARSEN AND TOUBRO LIMITED, MUMBAI		
	M/s	GEO MILLER & COMPANY PVT. LIMITED, INDIA		
	M/s	HINDUSTAN DORR OLIVER, INDIA		
	M/s	PARAMOUNT POLLUTION CONTROL LIMITED, INDIA		
	M/s	THERMAX, INDIA		
	M/s	IAEC, INDIA		
	M/s	DRIPLEX, INDIA		
<b>8</b>	<b>CARTRIDGE TYPE FILTER</b>			
	M/s	MULTITEX FILTRATION, NEW DELHI		
	M/s	OTOKLIN FILTERS, MUMBAI		
	M/s	FITTECH PHARMALAB PVT. LIMITED, NEW DELHI		
	M/s	SUPER FLO FILTERS, MUMBAI		
	M/s	GRAND PRIX ENGG. PVT. LTD, DELHI		
	M/s	FILTRATION ENGINEERING (I) PVT LTD	INDIGENOUS	CS/SS FABRICATED UPTO 6"
	M/s	GUJARAT OTOFILT	INDIGENOUS	MOC: CS/SS
	M/s	PALL INDIA PVT LTD	INDIGENOUS	
	M/s	PETROMAR ENGEERED SOLN.P LTD-FORM.R166	INDIGENOUS	UPTO 20MM THICK
	M/s	ULTRAFILTER (INDIA) PVT LTD	INDIGENOUS	
	M/s	FAUDI GMBH	FOREIGN	
	M/s	FILTREX S.R.L.	FOREIGN	

	M/s	FORAIN S.R.L.	FOREIGN	
	M/s	JFC CORPORATION	FOREIGN	
	M/s	PECO FACET	FOREIGN	
	M/s	PLENTY FILTERS	FOREIGN	
	M/s	INDCON PROJECTS & EQUIPMENT LTD, NEW DELHI	INDIGENOUS	
<b>9</b>	<b>FILTER SEPARATOR</b>			
	M/s	GRAND PRIX ENGG. PVT. LTD, DELHI		
	M/s	MULTITEX FILTRATION ENGINEERS LTD	INDIGENOUS	
	M/s	PETROMAR ENGEERED SOLN.P LTD-FORM.R166	INDIGENOUS	
	M/s	FAUDI GMBH	FOREIGN	
	M/s	FORAIN S.R.L.	FOREIGN	
	M/s	PECO FACET	FOREIGN	
	M/s	PLENTY FILTERS	FOREIGN	
	M/s	PEERLESS MFG. CO., USA (Through Peerless Process Systems Pvt Ltd India)	FOREIGN	
<b>10</b>	<b>FILTER-BASKET</b>			
	M/s	FILTRATION ENGINEERING PVT LTD	INDIGENOUS	MOC OF SHELL: CS/SS CAST AND FABRICATED.INLET NOZZLE SIZE 28"
	M/s	FLASH POINT EQUIPMWNTS PVT LTD	INDIGENOUS	1.INLET NOZZLE SIZE UPTO 8",RATING UPTO 300#, 2. SIZE UPTO 24",RATING 150#,MOC OF
	M/s	GRAND PRIX ENGG. PVT. LTD, DELHI		
	M/s	GUJARAT OTOFILT	INDIGENOUS	MOC OF SHELL:CS/SS
	M/s	MULTITEX FILTRATION ENGINEERS LTD	INDIGENOUS	

	M/s	PETROMAR ENGINEERED SOLN.P LTD-FORM.R166	INDIGENOUS	CS/SS, INHOUSE BENDING /ROLLING THICKNESS UPTO 20MM
	M/s	FILTREX S.R.L	FOREIGN	
	M/s	FLUID ENGINEERING	FOREIGN	
<b>11</b>	<b>QUICK OPENING CLOSURE (FILTER/SEPARATOR)</b>			
	M/s	MULTITEX FILTRATION ENGINEERS LTD	INDIGENOUS	BAND LOCK TYPE, UPTO 42" AND 900#
	M/s	GD ENGINEERING	INDIGENOUS	
	M/s	PECO FACET	INDIGENOUS	
<b>12</b>	<b>PUMP CENTRIFUGAL</b>			
	M/s	ITT CORPORATION INDIA PVT. LTD., VADODARA		GPP & GWS
	M/s	KISHORE PUMPS, PUNE	INDIA	GPP & GWS
	M/s	SU MOTORS PVT LTD	INDIA	GPP & GWS
	M/s	KIRLOSKAR BROTHERS LTD	INDIA	GPP, GWS & LCWS
	M/s	ARAI PUMP MANUFACTURING COMPANY LTD	FOREIGN	GPP, SPP & MULTI STAGE SPP
	M/s	RUHRPUMPEN INDIA PVT. LIMITED	INDIA	GPP, SPP, GWS & MULTI STAGE SPP
	M/s	AKAY INDUSTRIES, HUBLI	INDIA	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	BHARAT PUMPS & COMPRESSORS LTD	INDIA	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	CLYDE UNION LIMITED	FOREIGN	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	DMW CORPORATION(JAPAN)	FOREIGN	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	EBARA CORPORATION (JAPAN)	FOREIGN	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	FLOWSERVE (THOMPSONS KELLY & LEWIS PTY LTD)	FOREIGN	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	FLOWSERVE CORPORATION	FOREIGN	GPP, SPP, GWS, LCWS & MULTI STAGE SPP

	M/s	FLOWSERVE INDIA CONTROLS (P) LTD PUMP DIVISION	INDIA	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	GOULDS PUMPS INC	FOREIGN	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	KIRLOSKAR EBARA PUMPS LTD	INDIA	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	KSBAKTIENGESSELSCHAFT	FOREIGN	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	KSB PUMPS LTD (POONA)	INDIA	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	MATHER AND PLATT, PUNE	INDIA	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	RUHRPUMPEN GMBH (FORMERLY THYSSENT 509)	FOREIGN	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	SHIN NIPPON MACHINERY CO LTD	FOREIGN	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	SULZER PUMPEN DEUTSCHLAND GMBH	FOREIGN	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	SULZER PUMPS (US) INC	FOREIGN	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	SULZER PUMPS INDIA LIMITED	INDIA	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	WEIR GABBIONETA	FOREIGN	GPP, SPP, GWS, LCWS & MULTI STAGE SPP
	M/s	BEACON WEIR LIMITED	INDIA	GWS & LCWS
	M/s	JYOTI LIMITED	INDIA	GWS & LCWS
	M/s	FLOWMORE LIMITED	INDIA	GWS
	M/s	WPIL LTD (CAPACITY WITH MAX POWER RATING 500 KW AND MAX HEAD 200 m)	INDIA	GWS
	M/s	DMW Corporation India Pvt Limited	INDIA	SPP
	M/s	WEIR MINERALS NETHERLANDS BV	FOREIGN	SPP
	M/s	NUOVO PIGNONE SPA (ITALY)	FOREIGN	MULTI STAGE SPP
<b>NOTE: GPP - General Purpose Pump, SPP - Special Purpose Pump, GWS - General Water Services, LCWS - Large Capacity Water Services.</b>				



<b>17</b>	<b>MAIN INJECTION/ MAIN OIL LINE PUMPS</b>			
	M/s	FUJI ELECTRIC, JAPAN		
	M/s	MATHER PLATT, UK		
	M/s	LOHER AG, GERMANY		
	M/s	ANSALDO, ITALY		
	M/s	PARSON PEEBLES, UK		
	M/s	SIEMENS, GERMANY		
	M/s	WEIR PUMPS		
	M/s	EBARA PUMP		
	M/s	POMPES GUINARD		
	M/s	DAVID BROWN		
	M/s	SULZER PUMPS (INDIA) LTD.		
	M/s	DMW CORPORATION, JAPAN		
<b>18</b>	<b>RECIPROCATING DOSING /METERING PUMPS</b>			
	M/s	MILTON ROY INTERNATIONAL		
	M/s	BRAN & LUEBBE, GERMANY		
	M/s	LEWA, GERMANY		
	M/s	NIKKISO, JAPAN		
	M/s	DOSAPRO, FRANCE		
	M/s	WALLACE & TIEMAN, UK		
	M/s	PERONI POMPE SPA,		
	M/s	MATZ PUMPS, AHMEDABAD		
	M/s	SWELORE ENGG. (P) LIMITED, AHMEDABAD		
	M/s	V.K. PUMPS INDUSTRIES, MUMBAI		
	M/s	GREAVES COTTON & CO. LIMITED, NEW DELHI		
	M/s	SHAPOTOOLS, MUMBAI		
	M/s	METACHEM, MUMBAI		
	M/s	ASIA LMI PVT LIMITED, MADRAS		
	M/s	UNION, USA		
	M/s	WILLIAM INSTRUMENT CO. INC		
	M/s	ALFA LAVAL		
	M/s	NUOVO PIGANONE, UK.		
	M/s	OFFICINE MECCANICHE GALLARATESI, ITALY		
<b>19</b>	<b>PUMP-RECIPRO (API 675, PLUNGER/DIAPHRAGM)</b>			

	M/s	ACCUDYNE INDUSTRIES INDIA PRIVATE LIMITED, CHENAGALPATTU		
	M/s	SHAPOTOOLS	INDIA	
	M/s	SWELORE ENGG. (P) LTD	INDIA	
	M/s	V.K. PUMPS INDUSRIES	INDIA	
	M/s	ALLLDOS SOSIERTECHNIK GMBH	FOREIGN	
	M/s	BRAN + LUEBBE LTD	FOREIGN	
	M/s	DOSAPRO MILTON ROY	FOREIGN	
	M/s	FLOWSERVE CORPORATION	FOREIGN	
	M/s	NIKKISO CO LTD	FOREIGN	
	M/s	ORLITA GMBH & CO KG	FOREIGN	
	M/s	PERONI POMPE SPA	FOREIGN	
	M/s	PULSA FEEDER (UNIT OF INDEX CORP)	FOREIGN	
	M/s	WEIR MINERALS NETHERLANDS BV	FOREIGN	
	M/s	WILLIAMS INSTRUMENT COMPANY INC	FOREIGN	
	M/s	WANNER ENGINEERING INC, USA	FOREIGN	
<b>20</b>	<b>CHEMICAL STORAGE &amp; DOSING SYSTEM</b>			
	M/s	ACCUDYNE INDUSTRIES INDIA PRIVATE LIMITED, CHENAGALPATTU		
	M/s	NIKKISO, JAPAN		
	M/s	CED PROJECT LTD., BUCKINGHAM SHINE UK		
	M/s	BRAN & LUEBBE (GB) LTD. UK		
	M/s	KAY INTERNATIONAL		
	M/s	OSWAL INFRASTRUCTURE LIMITED, GANDHI NAGAR (GUJARAT)		
<b>21</b>	<b>DOSING PACKAGE (SKID MOUNTED)</b>			
	M/s	ENPRO INDUSTRIES PVT LTD	INDIA	PRESSURE UPTO 200KG/CM2,CAP ACITY-0.1 TO 3000LPM
	M/s	ACCUDYNE INDUSTRIES INDIA PRIVATE LIMITED, CHENAGALPATTU		
	M/s	SWELORE ENGG. (P) LTD	INDIA	
	M/s	V.K.PUMPS INDUSTRIES	INDIA	
	M/s	PETRONASH FZE	FOREIGN	
	M/s	KUPPS & SACHS INDIA PVT. LIMITED, CHENNAI.	INDIA	

	M/s	INDCON PROJECTS & EQUIPMENT LIMITED, NEW DELHI		
<b>22</b>	<b>FIRE WATER PUMP- As Per NFPA-20 GUIDELINE</b>			
	M/s	WEIR PUMPS		
	M/s	POMPES GUINARD		
	M/s	FLUID POWER		
	M/s	PEERLESS PUMPS		
	M/s	INGERSOLL RAND		
	M/s	WORTHINGTON PUMPS		
	M/s	THOMPSON PUMPS		
	M/s	KSB PUMPS		
	M/s	EBARA CORPORATION		
	M/s	SPP		
	M/s	MATHER AND PLATT		
	M/s	FLOWMORE LTD		
	M/s	KIRLOSKAR BROTHERS LIMITED		Up to 1000 m3/hr
<b>23</b>	<b>SCREW AIR COMPRESSOR</b>			
	M/s	TIDE AIR		
	M/s	ATLAS CAPCO		
	M/s	WORTHINGTON TURBODYNE		
	M/s	NORWALK		
	M/s	COMPARE		
	M/s	INGERSOLL RAND		
	M/s	ELGI		
	M/s	KIRLOSKAR PNEUMATICS		
	M/s	AIRPACK		
	M/s	BELLIES		
	M/s	KOBE STEEL LTD		
	M/s	HOWDEN PROCESS COMPRESSORS		
	M/s	NEUMAN & ESSAR		
	M/s	AERZENER		
	M/s	ATLAS COPCO CREPELLE		
	M/s	DRESSER-RAND		
<b>24</b>	<b>RECIPROCATING AIR COMPRESSOR</b>			
	M/s	INGERSOLL RAND		
	M/s	KIRLOSKAR PNEUMATICS CO.,		
	M/s	ELGI.		
	M/s	CONSOLIDATED PNEUMATICS TOOL CO. (I) LTD.		

	M/s	BHARAT PUMPS & COMPRESSORS LTD.,		
	M/s	ATLAS COPCO		
	M/s	BURCKHARDT COMPRESSION (INDIA) PVT LTD	INDIA	
	M/s	DRESSER RAND INDIA PVT LTD	INDIA	UPTO 1800 KW
	M/s	ANDREAS HOFER HOCHDRUCKTECHNIK GMBH	FOREIGN	FOR H2S ALSO
	M/s	BURCKHARDT COMPRESSIN AG	FOREIGN	
	M/s	DRESSER RAND COMPANY	FOREIGN	
	M/s	KOBE STEEL LTD	FOREIGN	
	M/s	LEOBERSDORFER MASCHINENFABRIK AG (LMF)	FOREIGN	
	M/s	NEUMAN & ESSER USA INC	FOREIGN	
	M/s	NUOVO PIGNONE SPA (ITALY) (GE OILCO.)	FOREIGN	
	M/s	PETER BROTHERHOOD LTD (DRESSER RAND CO)	FOREIGN	FOR H2S ALSO
<b>25</b>	<b>COMP.HIGH PRESSURE (Plant &amp; Instrument Air service)</b>			
	M/s	LEOBERSDORFER MASCHINFABRIK AG (LMF)	INDIA	
	M/s	SIAD MACCHINE IMPINTI SPA	INDIA	
<b>26</b>	<b>AIR DRYER</b>			
	M/s	CHEMINNERS		
	M/s	CLEAN AIR		
	M/s	DEL AIR INDIA PVT. LTD.		
	M/s	MIRCH MIREX		
	M/s	INDCON PROJECTS & EQUIPMENT LTD., NEW DELHI		
<b>27</b>	<b>DRIER-AIR/GAS</b>			
	M/s	CICB-CHEMICON	INDIGENOUS	
	M/s	DELAIR INDIA PVT LTD	INDIGENOUS	
	M/s	INDCON PROJECTS & EQUIPMENT LIMITED, NEW DELHI	INDIGENOUS	
	M/s	LLOYDS STEEL INDUSTRIES LTD	INDIGENOUS	
	M/s	SUMMITS HYGRONICS PVT LTD	INDIGENOUS	
	M/s	TRIDENT PNEUMATIC PVT LTD	INDIGENOUS	
	M/s	ULTRAFILTER (INDIA) PVT LTD	INDIGENOUS	
<b>28</b>	<b>RECIPROCATING HYDROCARBON GAS COMPRESSORS</b>			

	M/s	BPCL, NAINI		
	M/s	CATERPILLAR		
	M/s	COOPER ENGINEERING SERVICES, OHIO		
	M/s	ENERFLEX LTD., CANADA		
	M/s	INGERSOLL RAND, INDIA		
	M/s	HANOVER COMPRESSORS CO., USA		
	M/s	KIRLOSKAR PNEUMATICS.		
	M/s	STEWART & STEVENSON, HONGKONG		
	M/s	WEATHERFORD GLOBAL COMPRESSION SERVICES, TULSA		
	M/s	BURCKHARDT COMPRESSION (INDIA) PVT LTD	INDIA	
	M/s	DRESSER RAND INDIA PVT LTD	INDIA	
	M/s	ANDREAS HOFER HOCHDRUCKTECHNIK GMBH	FOREIGN	FOR H2S ALSO
	M/s	ATLAS COPCO CREPELLE	FOREIGN	
	M/s	BURCKHARDT COMPRESSIN AG	FOREIGN	
	M/s	DRESSER RAND COMPANY	FOREIGN	
	M/s	HOWDEN BC COMPRESSORS	FOREIGN	
	M/s	HOWDEN THOMASSEN COMPRESSORS (HOWDEN GROP)	FOREIGN	FOR H2S ALSO
	M/s	IHI CORPORATION	FOREIGN	
	M/s	KOBE STEEL LTD	FOREIGN	
	M/s	LEOBERSDORFER MASCHINENFABRIK AG (LMF)	FOREIGN	
	M/s	NEUMAN & ESSER USA INC	FOREIGN	
	M/s	NUOVO PIGNONE SPA (ITALY) (GE OILCO.)	FOREIGN	FOR H2S ALSO
	M/s	PETER BROTHERHOOD LTD (DRESSER RAND CO)	FOREIGN	FOR H2S ALSO
	M/s	Ariel Corporation U.S.A	Foreign	
<b>29</b>	<b>BLOWER</b>			
	M/s	SWAN PNEUMATIC		
	M/s	KAY INTERNATIONAL		
<b>30</b>	<b>HOT/ EOT CRANE</b>			
	M/S	Simplicity Project Pvt Ltd, New Delhi.		
	M/s	ARMSEL MHE PVT LTD.		HOT HAND operated, EOT

				)safe area, hazardous area
	M/s	AVON CRANES PVT., LTD.		
	M/s	EDDY CRANES ENGINEERS PVT. LTD.		HOT HAND operated, EOT (safe area, hazardous area)
	M/s	SAYAJI IRON & ENGINEERING CO. PVT. LTD.		
	M/s	BATLIBOI AND COMPANY		
	M/s	HERCULES HOIST LTD.		
	M/s	KALINGA ENGINEERS LIMITED		
	M/s	KHANDELWAL, MUMBAI		
	M/s	LIFTING EQUIPMENT ACCESSORIES		
	M/s	PULLEYING AND LIFTING MACHINE		
	M/s	SIKKA INTER PLANT SYSTEMS LTD.		
	M/s	STEELLA'S EQUIPMENT PVT. LTD. CHENNAI		
	M/s	TAK MACHINERY AND LEASING LIMITED		
	M/s	TRACTEL TIRFOR INDIA PVT. LTD.		
	M/s	W.H. BRADY.		
	M/s	GRIP ENGINEERS PVT LTD	INDIGENOUS	HOT HAND operated, EOT (safe area, hazardous area)
	M/s	MEEKA MACHINERY PVT LTD	INDIGENOUS	HOT HAND operated, EOT (safe area, hazardous area)
	M/s	SAFEX ELECTROMECH PVT LTD	INDIGENOUS	HOT HAND operated, EOT (safe area, hazardous area)
	M/s	ANUPAM INDUSTRIES LIMITED (ANAND)	INDIGENOUS	E.O.T (SAFE AREA)
	M/s	CONSOLIDATED HOISTS PVT LTD	INDIGENOUS	E.O.T (SAFE AREA)

	M/s	FURNACE AND FOUNDRY EQUIPMENT CO.	INDIGENOUS	E.O.T (SAFE AREA, hazardous area)
	M/s	HEAVY ENGINEERING CORPOTION LTD	INDIGENOUS	E.O.T (SAFE AREA)
	M/s	TATA STEEL GROWTH SHOP	INDIGENOUS	E.O.T (SAFE AREA)
	M/s	WMI CRANE LIMITED	INDIGENOUS	E.O.T (SAFE AREA)
	M/s	STAHL CRANE SYSTEMS GMBH	FOREIGN	E.O.T (SAFE AREA)
	M/s	Safex Energy Pvt Limited	INDIGENOUS	E.O.T (SAFE AREA)
<b>31</b>	<b>CHAIN PULLEY BLOCK</b>			
	M/s	Simplicity Projects Pvt Ltd, New Delhi.		
	M/s	INGERSOLL RAND USA.		
	M/s	BEEBE INTERNATIONAL INC USA.		
	M/s	DRESSER USA		
	M/s	AJMERA INDIA.		
	M/s	KITO JAPAN.		
	M/s	AIR DYNE UK		
	M/s	J BARNSLEY UK		
	M/s	ANSEL JONES UK		
	M/s	HERCULES HOISTS LTD	INDIGENOUS	APPD FOR SPARK PROOF ALSO UPTO 20 MT
	M/s	TRACTEL TIRFOR (I) PVT LTD	INDIGENOUS	
	M/s	W.H.BRADY & CO.LTD	INDIGENOUS	
<b>32</b>	<b>FLARE STACK</b>			
	M/s	ADOR WELDING LTD.		
	M/s	AIROIL FLARE GAS (INDIA) LTD.		
	M/s	COMBUSTION TECHNOLOGIES, PUNE		
	M/s	ITAS		
	M/s	KALDAIR		
	M/s	SAMIA		
	M/s	CALLIDUS TECHNOLOGIES, USA		
	M/s	HAMWORTHY COMBUSTION BENGINEERING SRL	FOREIGN	
	M/s	JOHN ZINK INTERNATIONAL LUXEMBOURG SARL	FOREIGN	
	M/s	NAO ONC	FOREIGN	

	M/s	ZEECO INC	FOREIGN	
	M/s	Europem NV	Foreign	
	M/s	PT KOTAMINYAK INTERNUSA , JAKARTA, INDONESIA	FOREIGN	
<b>33</b>	<b>PRESSURE VESSELS AND SHOP FABRICATED TANK</b>			
	M/s	BHPV, VIZAG		
	M/s	THERMAX, PUNE		
	M/s	INDIA TUBE MILLS, MUMBAI		
	M/s	INDUS ENGG. CO., MUMBAI		
	M/s	MISTRY PRABHUDAS MANJI, MUMBAI		
	M/s	NEWTON ENGG., VADODARA		
	M/s	PATEL FILTER, AHMEDABAD		
	M/s	ANUP, AHMEDABAD		
	M/s	G.R. ENGINEERING, MUMBAI		
	M/s	LARSON AND TOUBRO, HAZIRA		
	M/s	ISGEC, YAMUNA NAGAR		
	M/s	S.V.TANKS AND VESSELS, Mumbai		
	M/s	KILBURN, MUMBAI		
	M/s	R.D ENGINEERS MUMBAI		
	M/s	A K ENTERPRISES KOLHAPUR		
	M/s	SHREE SATYANARAYANA INDUSTRIAL SUPPLIERS PVT LTD, AMBERNATH, MUMBAI		
	M/s	NUBERG ENGG. LIMITED, NOIDA		
<b>34</b>	<b>VESSELS- ASME "U" CODE STAMPED</b>			
	M/s	L & T, HAZIRA/ PAWAI INDIA.		
	M/s	R.D.ENGINEERS, MUMBAI INDIA		
	M/s	KILBURN ENGG.LTD, MUMBAI, INDIA		
	M/s	BHEL, TRICHY, INDIA		
	M/s	MIS SHARJAH.		
	M/s	GMMOS DUBAI		
	M/s	SUNGJIN KOREA		
	M/s	FAI, SPA, BERGAMO		
	M/s	INDCON PROJECTS & EQUIPMENT LTD., NEW DELHI		
	M/s	MULTITEX FILTRATION ENGINEERS LTD. NEW DELHI		
	M/s	BGR ENERGY SYSTEMS LIMITED, CHENNAI		ENLISTMENT FOR CARBON STEEL



				VESSEL UPTO 18 mm SHELL THICKNESS
<b>35</b>	<b>PRESSURE VESSEL-(CARBON STEEL)</b>			
	M/s	DAEKYUNG TECHNOS CO LTD (SOUTH KOREA)	FOREIGN	*Category-(2), (3) & (4)
	M/s	DOOSAN ENGINEERING & CONSTN.CO.LTD	FOREIGN	*Category-(2), (3) & (4)
	M/s	FBM HUDSON ITALIANA S.P.A	FOREIGN	*Category-(2), (3) & (4)
	M/s	ISGEC (A UNIT OF SARASWATI INDL.SYND.)	INDIGENOUS	*Category-(2), (3) & (4)
	M/s	KNM PROCESS SYSTEMS SDN BHD	FOREIGN	*Category-(2), (3) & (4)
	M/s	LARSEN & TOUBRO LTD	INDIGENOUS	*Category-(2), (3) & (4)
	M/s	OFMECO SPA	FOREIGN	*Category-(2), (3) & (4)
	M/s	ROLLE S.P.A.	FOREIGN	*Category-(2), (3) & (4)
	M/s	SUNGJIN GEOTECHCO LTD	FOREIGN	*Category-(2), (3) & (4)
	M/s	HITACHI ZOSEN COORPORATION	FOREIGN	*Category-(2), (3) & (4)
	M/s	DAEBONG ACROTEC CO.LTD	FOREIGN	*Category-(2) & (3)
	M/s	DAEKYUNG MACHINERY & ENGINEERING CO.LTD	FOREIGN	*Category-(2) & (3)
	M/s	KCP LIMITED	INDIGENOUS	*Category-(2) & (3)
	M/s	IHI CORPORATION	FOREIGN	*Category-(3) & (4)
	M/s	OFFCINE LUIGI RESTA SPA	FOREIGN	*Category-(3) & (4)
	M/s	ESSAR HEAVY ENGINEERING SERVICES	INDIGENOUS	*Category-(1), (2), (3) & (4)
	M/s	GODREJ & BOYCE MFG.CO.LTD.	INDIGENOUS	*Category-(1), (2), (3) & (4)
	M/s	GR ENGINEERIN PRIVATE LTD (TARAPORE)	INDIGENOUS	*Category-(1), (2), (3) & (4)
	M/s	ALSTOM PROJECTS INDIA LIMITED	INDIGENOUS	*Category-(1), (2) & (3)
	M/s	BHEL (HARIDWAR)	INDIGENOUS	*Category-(1), (2) & (3)
	M/s	BHPV	INDIGENOUS	*Category-(1), (2) & (3)
	M/s	HINDUSTAN DORR-OLIVER LTD	INDIGENOUS	*Category-(1), (2) & (3)
	M/s	INDIA TUBE MILLS & METAL INDIA LTD	INDIGENOUS	*Category-(1), (2) & (3)
	M/s	INDUS PROJECTS LIMITED	INDIGENOUS	*Category-(1), (2) & (3)

	M/s	LLOYDS STEEL INDUSTRIES LTD	INDIGENOUS	*Category-(1), (2) & (3)
	M/s	NUBERG ENGG. LIMITED, NOIDA		*Category-(1), (2) & (3)
	M/s	PATELS AIRTEMP (INDIA) LTD	INDIGENOUS	*Category-(1), (2) & (3)
	M/s	PHILS HEAVY ENGINEERING PVT LIMITED	INDIGENOUS	*Category-(1), (2) & (3)
	M/s	PRECISION EQUIPMENTS (CHENNAI) PVT LTD	INDIGENOUS	*Category-(1), (2) & (3)
	M/s	TECHNO PROCESS EQUIPMENTS (INDIA) LTD	INDIGENOUS	*Category-(1), (2) & (3)
	M/s	VIJAY TANKS & VESSELS PVT LTD	INDIGENOUS	*Category-(1), (2) & (3)
	M/s	ADOR WELDING LIMITED, PUNE		*Category-(1)
	M/s	AERO ENGINEERS	INDIGENOUS	*Category-(1)
	M/s	ALFA LAVAL INDIA LTD	INDIGENOUS	*Category-(1)
	M/s	BENGAL TOOLS LIMITED	INDIGENOUS	*Category-(1)
	M/s	CICB-CHMICON	INDIGENOUS	*Category-(1)
	M/s	FACT ENGINEERING WORKS	INDIGENOUS	*Category-(1)
	M/s	FURNACE FABRICA (INDIA) LIMITED	INDIGENOUS	*Category-(1)
	M/s	JINDAL STEEL & POWER LTD	INDIGENOUS	*Category-(1)
	M/s	LOYAL EQUIPMENT PVT LTD	INDIGENOUS	*Category-(1)
	M/s	MCNALLY SAYAJI ENGINEERING LTD	INDIGENOUS	*Category-(1)
	M/s	MULTI MAX ENGINEERING WORKS PVT LTD	INDIGENOUS	*Category-(1)
	M/s	NEWTON ENGG & CHEMICALS	INDIGENOUS	*Category-(1)
	M/s	NOVATECH PROJECTS INDIA PVT LTD	INDIGENOUS	*Category-(1)
	M/s	OSWAL INFRASTRUCTURE LIMITED, GANDHINAGAR (GUJARAT) Under 'U' Stamp Category.	INDEGENOUS	*Category-(1)
	M/s	PROGEN SYSTEMS & TECHNOLOGIES LTD	INDIGENOUS	*Category-(1)
	M/s	RELIANCE FABRICATIONS PVT LTD	INDIGENOUS	*Category-(1)
	M/s	REYNOLDS CHEMEQUIP PVT LTD	INDIGENOUS	*Category-(1)
	M/s	TEAMCO HITECH ENGINEERING LTD	INDIGENOUS	*Category-(1)
	M/s	TECHNIP KT INDIA LTD (FORMERLY KTI LTD)	INDIGENOUS	*Category-(1)
	M/s	UNIQUE CHEMOPLANT EQUIPMENTS	INDIGENOUS	*Category-(1)
	M/s	UNIVERSAL HEAT EXCHANGERS LTD	INDIGENOUS	*Category-(1)
	M/s	ANUP ENGINEERING LIMITED	INDIGENOUS	*Category-(1) & (2)
	M/s	BHEL (BHOPAL)	INDIGENOUS	*Category-(1) & (2)
	M/s	BUILDWORTH LIMITED	INDIGENOUS	*Category-(1) & (2)
	M/s	EXPO GAS CONTAINERS LTD	INDIGENOUS	*Category-(1) & (2)

	M/s	FAB-TECH WORKS & CONSTN. PVT.LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	GANSONS LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	GEECY ENGINEERING PVT LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	GEMINI ENGI-FAB LIMITED, VALSAD, GUJARAT		*Category-(1) & (2)
	M/s	GMM PFAUDLER LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	GRAND PRIX ENGINEERING PVT LTD. DELHI	INDIGENOUS	*Category-(1) & (2)
	M/s	GRASIM INDUSTRIES	INDIGENOUS	*Category-(1) & (2)
	M/s	INDCON PROJECTS & EQUIPMENT LIMITED, NEW DELHI	INDIGENOUS	*Category-(1) & (2)
	M/s	INDUSTRIAL MANUFACTURERS	INDIGENOUS	*Category-(1) & (2)
	M/s	ISHAN EQUIPMENTS PVT LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	MEENAKSHI ASSOCIATES PVT LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	MULTITEX FILTRATION ENGINEERS LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	NEW FIELD INDUSTRIAL EQUIPMENT PVT LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	NILE LIMITED	INDIGENOUS	*Category-(1) & (2)
	M/s	ORIENTAL MANUFACTURERS PVT LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	PRABHA STEEL INDUSTRIES	INDIGENOUS	*Category-(1) & (2)
	M/s	R.D. ENGINEERS (INDIA) PVT LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	RAJ ENGINEERING COMPANY	INDIGENOUS	*Category-(1) & (2)
	M/s	SAURASHTRA ENGINEERING CORPN PVT LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	SHARP TANKS & STRUCTURALS (P) LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	SPETECH PLANT EQUIPMENT PVT LTD (SURAT)	INDIGENOUS	*Category-(1) & (2)
	M/s	UNITED HEAT TRANSFER PVT LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	CRYOSTAR TANKS AND VESSELS PVT. LTD., GREATER NOIDA	INDIGENOUS	*Category-(1)
	M/s	MEGHA ENGINEERING & INFRASTRUCTURES LTD		upto 60mm thickness
NOTE: *Category (i) = (Up to 25 mm), *Category (ii) = (From 26 mm to 50 mm), *Category (iii) = (From 51 mm to 100 mm), *Category (iv) = (>100 mm).				
36		Deleted	Refer Product Sl. No. 35	
37		Deleted	Refer Product Sl. No. 35	
38		Deleted	Refer Product Sl. No. 35	
39	<b>PRESSURE VESSEL – (STAINLESS STEEL)</b>			
	M/s	AERO ENGINEERS	INDIGENOUS	*Category-(1)
	M/s	ALFA LEVAL INDIA LTD	INDIGENOUS	*Category-(1)
	M/s	ALSTOM PROJECTS INDIA LIMITED	INDIGENOUS	*Category-(1) & (2)
	M/s	ANUP ENGINEERING LIMITED	INDIGENOUS	*Category-(1) & (2)
	M/s	BENGAL TOOLS LIMITED	INDIGENOUS	*Category-(1)
	M/s	BHEL (BHOPAL)	INDIGENOUS	*Category-(1) & (2)

	M/s	BHEL (HARIDWAR)	INDIGENOUS	*Category-(1) & (2)
	M/s	BHPV	INDIGENOUS	*Category-(1) & (2)
	M/s	DAEBONG ACROTEC CO.LTD	FOREIGN	*Category-(1) & (2)
	M/s	DAEKYUNG MACHINERY & ENGINEERING CO.LTD	FOREIGN	*Category-(1) & (2)
	M/s	DAEKYUNG TECHNOS CO LTD (SOUTH KOREA)	FOREIGN	*Category-(1) & (2)
	M/s	ESSAR HEAVY ENGINEERING SERVICES	INDIGENOUS	*Category-(1) & (2)
	M/s	EXPO GAS CONTAINERS LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	GANSONS LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	GEECY ENGINEERING PVT LTD	INDIGENOUS	*Category-(1)
	M/s	GEMINI ENGI-FAB LIMITED, VALSAD, GUJARAT		*Category-(1) & (2)
	M/s	GMM PFAUDLER LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	GODREJ & BOYCE MFG.CO.LTD.	INDIGENOUS	*Category-(1) & (2)
	M/s	GR ENGINEERING PRIVATE LTD (TARAPORE)	INDIGENOUS	*Category-(1) & (2)
	M/s	HINDUSTAN DORR-OLIVER LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	HITACHI ZOSEN CORPORATION	FOREIGN	*Category-(1) & (2)
	M/s	INDCON PROJECTS & EQUIPMENT LIMITED, NEW DELHI	INDIGENOUS	*Category-(1)
	M/s	INDIA TUBE MILLS & METAL INDIA LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	INDUS PROJECTS LIMITED	INDIGENOUS	*Category-(1) & (2)
	M/s	INDUSTRIAL MANUFACTURERS	INDIGENOUS	*Category-(1) & (2)
	M/s	ISGEC (A UNIT OF SARASWTI IND (SYND)	INDIGENOUS	*Category-(1) & (2)
	M/s	ISHAN EQUIPMENTS PVT LTD	INDIGENOUS	*Category-(1)
	M/s	KCP LIMITED	INDIGENOUS	*Category-(2)
	M/s	KNM PROCESS SYSTEMS SDN BHD	FOREIGN	*Category-(1) & (2)
	M/s	LARSEN & TOUBRO LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	LLOYDS STEEL INDUSTRIES LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	MEENAKSHI ASSOCIATES PVT LTD	INDIGENOUS	*Category-(1)
	M/s	MULTIMAX FILTRATION ENGINEERS LTD	INDIGENOUS	*Category-(1)
	M/s	NEW FIELD INDUSTRIAL EQUIPMENT PVT LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	NEWTON ENGG & CHMICALS	INDIGENOUS	*Category-(1)
	M/s	NILE LIMITED	INDIGENOUS	*Category-(1) & (2)

	M/s	NOVATECH PROJECTS INDIA PVT LTD	INDIGENOUS	*Category-(1)
	M/s	NUBERG ENGG. LIMITED, NOIDA		*Category-(1) & (2)
	M/s	PATELS AIRTEMP (INDIA) LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	PHILS HEAVY ENGINEERING PVT LIMITED	INDIGENOUS	*Category-(1) & (2)
	M/s	PRECISION EQUIPMENTS (CHEENAI) PVT LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	R.D. ENGINEERS (INDIA) PVT LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	RAJ ENGINEERING COMPANY	INDIGENOUS	*Category-(1)
	M/s	RELIANCE FABRICATIONS PVT LTD	INDIGENOUS	*Category-(1)
	M/s	REYNOLDS CHEMEQUIP PVT LTD	INDIGENOUS	*Category-(1)
	M/s	ROLLE. S.P.A.	FOREIGN	*Category-(1) & (2)
	M/s	SHARP TANKS & STRUCTURALS (P) LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	SPARKON ENGINEERS	INDIGENOUS	*Category-(1)
	M/s	SUNGJIN GEOTECHCO LTD	FOREIGN	*Category-(1) & (2)
	M/s	TEAMCO HITECH ENGINEERING LTD	INDIGENOUS	*Category-(1)
	M/s	TECHNIP KT INDIA LTD (FORMERLY KTI LTD)	INDIGENOUS	*Category-(1)
	M/s	TECHNO PROCESS EQUIPMENTS (INDIA) LTD	INDIGENOUS	*Category-(1)
	M/s	UNIVERSAL HEAT EXCHANGERS LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	VIJAY TANKS & VESSELS PVT LTD	INDIGENOUS	*Category-(1) & (2)
	M/s	WELDERS NV	FOREIGN	*Category-(1) & (2)
	M/s	MEGHA ENGINEERING & INFRASTRUCTURES LTD		*Category-(1) & (2)

NOTE: \*Category (i) = (Up to 25 mm), \*Category (ii) = (From 26 mm to 50 mm).

40	Deleted		Refer Product Sl. No. 39	
41	<b>STAINLESS STEEL CLAD VESSEL</b>			
	M/s	ABB- ABL		
	M/s	ANUP		
	M/s	BHEL, TRICHY		
	M/s	BHPV, VIZAG		
	M/s	GR ENGINEERING, BANGALORE		
	M/s	GODREJ, MUMBAI		
	M/s	ISGEC, YAMUNA NAGAR		
	M/s	LARSEN AND TOUBRO, HAZIRA / POWAI		
	M/s	LLOYDS STEEL INDUSTRIES, MUMBAI		

	M/s	WALCHAND ABNAGAR INDUSTRIES		
	M/s	GEMINI ENGI-FAB LIMITED, VALSAD, GUJARAT		
<b>42</b>	<b>PAINT</b>			
	M/s	ASIAN PAINT		
	M/s	BERGER PAINT		
	M/s	GOODLAS NEROLAC		
	M/s	JOHNSON NICHOLSON		
	M/s	SHALIMAR		
	M/s	MUMBAI PAINT		
	M/s	ICI PAINT		
	M/s	NE PAINT UDYOG		
	M/s	JOTUN COATINGS, NORWAY		
	M/s	JOTUN INDIA PVT. LTD		
	M/s	HEMPEL PAINTS INDIA PVT. LTD., MUMBAI		
<b>43</b>	<b>MIXER AND AGITATOR</b>			
	M/s	MACNEIL AND MAGOR, MUMBAI		
	M/s	MIXRITE CORPORATION, MUMBAI		
	M/s	STANDARD ENGINEER, MUMBAI		
	M/s	REMI, MUMBAI		
<b>44</b>	<b>RECIPROCATING PUMP(API 674)</b>			
	M/s	BPCL, NAINI, ALLAHABAD		
	M/s	DAVID BROWN		
	M/s	PERONI POMPE SPA, ITALY		
	M/s	WEATHERFORD, HOUSTON, TEXAS, USA		
	M/s	NATIONAL OIL WELL VARCO,LP USA		
	M/s	DMW CORPORATION, JAPAN		
	M/s	GOMA ENGINEERING PVT LTD. THANE		
	M/s	HIRONISHA SYSTEM PVT LTD , AHMEDABAD	INDIAN	UPTO 20 M3/HR AND 100 KG PRESSURE
	M/s	DAWSON DOWNIE LAMONT LTD	FOREIGN	STEAM DRIVEN
	M/s	FLOWSERVE CORPORATION	FOREIGN	
	M/s	NIKKISO CO LTD (NIKKISO K.K.)	FOREIGN	
	M/s	WEIR MINERALS NETHERLANDS BV	FOREIGN	NOT FOR PLUNGER TYPE
<b>45</b>	<b>PUMP-AIR OPERATED DIAPHRAGM</b>			

	M/s	HI-LIFE MANUFACTURING CO.	INDIA	FLOW RANGE UPTO 45 CU.M/HR
	M/s	MONIBA ANAND ELECTRICALS PVT LTD	INDIA	
<b>46</b>	<b>AIR FLOATATION UNIT (DAF)</b>			
	M/s	PV, HOLLAND		
	M/s	WEMCO, UK		
	M/s	CECA, FRANCE		
	M/s	ENVIREX, USA		
	M/s	MONOSCAP INC., USA		
	M/s	SKIMOVEX, HOLLAND		
	M/s	ENGINEERING SPECIALITIES INC., USA		
	M/s	ADEC ENGINEERING, USA		
	M/s	K-PACK INTERNATIONAL		
	M/s	ESMIL WATER SYSTEMS LIMITED		
	M/s	PETROLITE		
	M/s	PARAMOUNT POLLUTION CONTROL LIMITED, BARODA		
	M/s	TRIVENI ENGINEERING, NEW DELHI		
	M/s	HINDUSTAN DORR OLIVER, INDIA		
	M/s	GEO MILLER INDIA		
	M/s	VOLTAS, INDIA		
<b>47</b>	<b>PLATE INTERCEPTOR</b>			
	M/s	JOHN BROWN, UK		
	M/s	NIJHUIS, HOLLAND		
	M/s	WEMCO. UK		
	M/s	CECA, FRANCE		
	M/s	P V, HOLLAND		
	M/s	UTB, SWITZERLAND		
	M/s	LANCY INTERNATIONAL, USA		
	M/s	ENGINEERING SPECIALITIES INC., USA		
	M/s	PEILKENROD, UK		
	M/s	HYDE, UK		
	M/s	SKIMOVEX, HOLLAND		
	M/s	ADEC ENGINEERING, USA		
	M/s	KROFTA ENGINEERING, USA		
	M/s	K-PACK INTERNATIONAL		

	M/s	PARAMOUNT POLLUTION CONTROL LIMITED, BARODA		
	M/s	TRIVENI ENGINEERING, NEW DELHI		
	M/s	K-PACK SYSTEMS PVT LTD		
<b>48</b>	<b>CENTRIFUGE</b>			
	M/s	PANNWALT, INDIA		
	M/s	ALFA-LAVAL, INDIA		
	M/s	MBE Coal & Mineral Technology India Pvt. Ltd		
<b>49</b>	<b>OIL SKIMMER (DRUM / DISC TYPE)</b>			
	M/s	BP AGENCIES (INDIA) LTD.,		
	M/s	CECA, FRANCE		
	M/s	DISCOIL, ITALY		
	M/s	LIGHTNIN, USA		
	M/s	SKIMOVEX, HOLLAND		
	M/s	ENGINEERING SPECIALITIES INC, USA		
<b>50</b>	<b>OIL SKIMMER (SLOTTED PIPE TYPE)</b>			
	M/s	HINDUSTAN DORR OLIVER, INDIA		
	M/s	LIGHTNIN, USA		
	M/s	GEOMILLER, INDIA		
	M/s	VOLTAS, INDIA		
	M/s	ENVIREX, USA		
<b>51</b>	<b>CLARIFIER/ CLARIFLOCCULATOR</b>			
	M/s	HINDUSTAN DORR OLIVER, INDIA		
	M/s	GEOMILLER, INDIA		
	M/s	EIMCO KCP, INDIA		
	M/s	PARAMOUNT, INDIA		
	M/s	VOLTAS, INDIA		
	M/s	NAVBHARAT ENVIROTECH, INDIA		
	M/s	KEC, INDIA		
<b>52</b>	<b>SURFACE AERATOR</b>			
	M/s	HINDUSTAN DORR OLIVER, INDIA		
	M/s	VOLTAS, INDIA		
	M/s	PARAMOUNT, INDIA		
	M/s	GEOMILLER, INDIA		
	M/s	EIMCO KCP, INDIA		
	M/s	POLUTECH LTD., INDIA (FOR FLOATING TYPE)		
	M/s	HE (HYLIC)		



	M/s	BIOTEC ENVIROCARE SYSTEMS PVT. LTD		
<b>53</b>	<b>DG SET</b>			
	M/s	BHEL, BHOPAL, INDIA		
	M/s	DIESEL LOCOMOTIVE WORKS		
	M/s	GARDEN REACH SHIPBUILDERS & ENGRS LTD.		
	M/s	GREAVES LTD.		UPTO 285KVA
	M/s	JEEVAN DIESELS AND ELECTRICALS LIMITED.		UPTO 1250 KVA
	M/s	KIRLOSKAR OIL ENGINES LIMITED		
	M/s	MAN B&W DIESEL LTD		
	M/s	NISHIBA ELECTRIC CO LTD		
	M/s	TIL LIMITED (SAHIBABAD WORKS))		UPTO 10- 1000KVA
	M/s	TRADING ENGINEERS (INTER NATIONAL) LTD		UPTO 1250 KVA
	M/s	WARTSILA INDIA LIMITED		
	M/s	GREAVES COTTON	INDIA	UPTO 500 KVA
	M/s	JAKSON LIMITED	INDIA	UPTO 2000 KVA
	M/s	POWERICA LTD	INDIA	UPTO 1500 KVA
	M/s	SUDHIR GENSETS LTD	INDIA	15 TO 1250 KVA
	M/s	Wartsila Finland Oy	Foreign	
<b>53A</b>	<b>GAS ENGINES FOR GEN SET APPLICATION</b>			
		GE Jenbacher, Austria	Foreign	
		Caterpillar, USA	Foreign	
		Caterpillar Energy Solution Gmbh (formerly MWM Gmbh) for Gas Engine Capacity upto 4300 KW (ISO) Rating.	Foreign	
		Wartsila Finland OY	Foreign	
<b>53B</b>	<b>GAS ENGINES FOR COMPRESSOR DRIVE</b>			
		Caterpillar, USA	Foreign	
		WAKESHA, USA	Foreign	
If the offered model is having higher capacity than indicated Kw against Engine Vendor, Gas Engine Vendor to furnish the proven track record (PTR) of the offered model as per the EQD Criteria and format enclosed along with the Gas Engine specification during detailed engineering. The acceptance of the model will be evaluated further based on the satisfactory track record and user certificates to be furnished by the bidder.				
<b>54</b>	<b>UTILITY GENERATOR - C. ENGINE SUPPLIER AND PACKAGER</b>			
	M/s	STEWART AND STEVENSON, USA		
	M/s	GEEKE MOTOREN, NETHERLANDS		
	M/s	CATERPILLAR, USA		

	M/s	KATO, USA		
	M/s	RUSTON DIESEL , USA		
	M/s	WAUKESHA PEARCE IND. INC , USA		
	M/s	CUMMINS, USA		
	M/s	DETROIT DIESEL, USA		
	M/s	REGON EQUIPMENT CO., USA		
<b>55</b>		<b><i>DIESEL ENGINE (Including Prime mover for Fire water pump )</i></b>		
	M/s	DIESEL LOCOMOTIVE WORKS	INDIA	UPTO 2600HP
	M/s	GREAVES COTTON	INDIA	UPTO 450 KW
	M/s	KIRLOSKAR OIL ENGINES LTD	INDIA	2200 TO 7200 HP
	M/s	WARTSILA INDIA LTD	INDIA	
	M/S	WARTSILA FRANCE S.A.S	FOREIGN	
	M/s	CUMMINS INDIA LTD	INDIA	
	M/s	CATERPILLAR INDIA LTD	INDIA	
<b>56</b>		<b>SEPARATORS (OIL &amp; GAS)</b>		
	M/s	NATCO, USA		
	M/s	KVAERNER PROCESS SYSTEM (AKER-KVAERNER GROUP)		
	M/s	BURGESS - MANNING INC., USA		
	M/s	KOCH - GLITSCH LP, USA		
	M/s	GASTECH, USA		
	M/s	OGSP CUTTER PROCESS SOLUTIONS INDIA PVT. LTD., NEW DELHI		
		FABRICATION SHALL BE CARRIED OUT BY M/S INDCON PROJECTS & EQUIPMENT LTD. WHO SHALL BE RESPONSIBLE FOR FABRICATION, QA/QC AND THE CERTIFICATIONS LIKE ASME AND U & R STAMP.		
	M/s	MULTITEX FILTERATION ENGRS LTD.		
	M/s	LAKSEL EPS TECHNOLOGIES PTE LTD., SINGAPORE		
		Fabrication shall be carried out by M/s Hupseng (HSOEL), Singapore who shall be responsible for fabrication, QA/QC and the certifications like ASME and U & R stamp.		
	M/s	MACKENZIE HYDROCARBONS PTY., AUSTRALIA		

	M/s	GRAND PRIX ENGG. PVT. LTD, DELHI		
	M/s	DYNA-THERM CORPORATION	INDIGENOUS	
	M/s	BGR ENERGY SYSTEMS LIMITED, CHENNAI		INTERNAL DIAMETER IN CASE OF 3 PHASE SEPARATOR IS LIMITED TO 2000 mm
	M/s	PROCESS GROUP INTERNATIONAL LTD., ABU DHABI		
	M/s	INDCON PROJECTS & EQUIPMENT LIMITED, NEW DELHI		
	<b>NOTE: Above vendors shall provide overall guarantee (including Process &amp; Mechanical guarantee) for the vessel. The fabrication shall be carried out by the specific sub-vendor, if mentioned. If sub-vendor is not mentioned, fabrication can be carried out through ASME authorised fabricator. Sub-vendor details shall be submitted for approval of the company.</b>			
<b>57</b>	<b>TRETIARY SEPARATOR</b>			
	M/s	BELCO TECHNOLOGIES CORPORATION	INDIGENOUS	
<b>58</b>	<b>HEATER TREATERS &amp; BATH HEATERS</b>			
	M/s	NATCO-USA		
	M/s	JOHN PICKLE -USA		
	M/s	JOY INDUSTRIES - USA		
	M/s	MACKENZIE HYDROCARBONS - AUSTRALIA		
	M/s	GASTECH - USA (for Heater Treater only)		
	M/s	OGSP CUTTER PROCESS SOLUTIONS INDIA PVT. LTD., NEW DELHI (for bath heater only)		
	M/s	MULTITEX FILTRATION ENGRS LTD. (for bath heater only)		
	M/s	BGR Energy Systems Ltd		Bath Heater only
	M/s	Novargi Industries S.L		Bath Heater only
	M/s	GRAND PRIX ENGG. PVT. LTD, DELHI		Bath Heater only
	M/s	AMR PROCESS INC, CANADA (for heater treater only)		Heater Treater only
	M/s	PROCESS GROUP INTERNATIONAL LTD., ABU DHABI		

	<b>NOTE : Above vendors shall provide overall guarantee (including Process &amp; Mechanical guarantee) for the vessel. The fabrication can be carried out through ASME authorised fabricator. Sub-vendor details shall be submitted for approval of the company.</b>		
<b>59</b>	<b>HEAT EXCHANGER</b>		
	M/s	ANUP ENGINEERING LIMITED (THE GANSON LIMITED)	
	M/s	GEECY ENGINEERS PVT LTD	
	M/s	LLOYDS STEEL INDUSTRIES LIMITED	
	M/s	PATELS AIRTEMP (INDIA) LTD	
	M/s	PRABHA STEEL INDUSTRIES	
	M/s	PRECISION EQUIPMENT (CHENNAI) PVT LTD.	
	M/s	REYNOLDS CHEMEQUIP PVT. LTD.	
	M/s	TECHNO PROCESS EQUIPMENT (INDIA) LTD.	
	M/s	TITANIUM EQUIPMENT & ANODE MANUFACTURES	
	M/s	UNIVERSAL HEAT EXCHANGERS LTD.	
	M/s	WALCHAND NAGAR INDUSTRIES LTD.	
	M/s	L&T	
	M/s	BHPV, VISAKHAPATNAM	
	M/s	NUBERG ENGINEERING LTD (CS SHELL AND TUBE HEAT EXCHANGER)	
<b>60</b>	<b>HEAT EXCHANGER CARBON STEEL</b>		
	M/s	<i>AERO ENGINEERS</i>	<i>INDIGENOUS</i>
	M/s	<i>ALFA LEVAL INDIA LTD</i>	<i>INDIGENOUS</i>
	M/s	<i>ANUP ENGINEERING LIMITED</i>	<i>INDIGENOUS</i>
	M/s	<i>BENGAL TOOLS LIMITED</i>	<i>INDIGENOUS</i>
	M/s	<i>BHEL (HARIDWAR)</i>	<i>INDIGENOUS</i>
	M/s	<i>BHEL (HYDERABAD)</i>	<i>INDIGENOUS</i>
	M/s	<i>BHPV (BHOPAL)</i>	<i>INDIGENOUS</i>
	M/s	<i>BHPV</i>	<i>INDIGENOUS</i>
	M/s	<i>BUILDWORTH LIMITED</i>	<i>INDIGENOUS</i>
	M/s	<i>CICB-CHEMICON</i>	<i>INDIGENOUS</i>
	M/s	<i>ESSAR HEAVY ENGINEERING SERVICES</i>	<i>INDIGENOUS</i>
	M/s	<i>EXPO GAS CONTAINERS LTD</i>	<i>INDIGENOUS</i>

	M/s	GANSONS LTD	INDIGENOUS	
	M/s	GMM PFAUDLER LTD	INDIGENOUS	
	M/s	GODREJ & BOYCE MFG.CO.LTD.	INDIGENOUS	
	M/s	GR ENGINEERING PRIVATE LTD (TARAPORE)	INDIGENOUS	
	M/s	HINDUSTAN DORR-OLIVER LTD	INDIGENOUS	
	M/s	INDCON PROJECTS & EQUIPMENTS LTD. NEW DELHI	INDIGENOUS	
	M/s	INDIA TUBE MILLS & METAL INDIA LTD	INDIGENOUS	
	M/s	INDUS PROJECTS LIMITED	INDIGENOUS	
	M/s	INDUSTRIAL MANUFACTURERS	INDIGENOUS	
	M/s	ISGEC (A UNIT OF SARASWTI INDL (SYND )	INDIGENOUS	
	M/s	MEENAKSHI ASSOCIATES PVT LTD	INDIGENOUS	
	M/s	MULTIMAX ENGINEERING WORKS PVT LTD	INDIGENOUS	
	M/s	NEW FIELD INDUSTRIAL EQUIPMENT PVT LTD	INDIGENOUS	
	M/s	NEWTON ENGG & CHMICALS	INDIGENOUS	
	M/s	ORIENTAL MANUFACTURERS PVT LTD	INDIGENOUS	
	M/s	PHILS HEAVY ENGINEERING PVT LIMITED	INDIGENOUS	
	M/s	R.D. ENGINEERS (INDIA) PVT LTD	INDIGENOUS	
	M/s	RAJ ENGINEERING COMPANY	INDIGENOUS	
	M/s	TEAMCO HITECH ENGINEERING LTD	INDIGENOUS	
	M/s	DAEBONG ACROTEC CO.LTD	FOREIGN	
	M/s	DAEKYUNG MACHINERY & ENGINEERING CO .LTD	FOREIGN	
	M/s	DAEKYUNG TECHNOS CO LTD (SOUTH KOREA)	FOREIGN	
	M/s	DOOSAN ENGINEERING & CONSTN .CO .LTD	FOREIGN	
	M/s	FEM HUDSON ITALIANA S.P.A.	FOREIGN	
	M/s	HANTECH LIMITED	FOREIGN	
	M/s	OFMECO SPA	FOREIGN	
	M/s	ROLLE S.P.A.	FOREIGN	
	M/s	SUNGJIN GEOTECHCO LTD	FOREIGN	

	M/s	GEMINI ENGI-FAB LIMITED, VALSAD, GUJARAT		
<b>61</b>	<b>HEAT EXCHANGER STAINLESS STEEL</b>			
	M/s	AERO ENGINEERS	INDIGENOUS	
	M/s	ALFA LEVAL INDIA LTD	INDIGENOUS	
	M/s	ANUP ENGINEERING LIMITED	INDIGENOUS	
	M/s	BENGAL TOOLS LIMITED	INDIGENOUS	
	M/s	BHEL (HARIDWAR)	INDIGENOUS	
	M/s	BHPV (BHOPAL)	INDIGENOUS	
	M/s	BHPV	INDIGENOUS	
	M/s	CICB-CHEMICON	INDIGENOUS	
	M/s	ESSAR HEAVY ENGINEERING SERVICES	INDIGENOUS	
	M/s	GANSONS LTD	INDIGENOUS	
	M/s	GMM PFAUDLER LTD	INDIGENOUS	
	M/s	GODREJ & BOYCE MFG.CO.LTD.	INDIGENOUS	
	M/s	GR ENGINEERING PRIVATE LTD (TARAPORE)	INDIGENOUS	
	M/s	HINDUSTAN DORR-OLIVER LTD	INDIGENOUS	
	M/s	INDCON PROJECTS & EQUIPMENT LIMITED, NEW DELHI	INDIGENOUS	
	M/s	INDIA TUBE MILLS & METAL INDIA LTD	INDIGENOUS	
	M/s	INDUS PROJECTS LIMITED	INDIGENOUS	
	M/s	INDUSTRIAL MANUFACTURES	INDIGENOUS	
	M/s	ISGEC (A UNIT OF SARASWTI INDL (SYND)	INDIGENOUS	
	M/s	MEENAKSHI ASSOCIATES PVT LTD	INDIGENOUS	
	M/s	NEW FIELD INDUSTRIAL EQUIPMENT PVT LTD	INDIGENOUS	
	M/s	NEWTON ENGG & CHEMICALS	INDIGENOUS	
	M/s	ORIENTAL MANUFACTURERS PVT LTD	INDIGENOUS	
	M/s	PHILS HEAVY ENGINEERING PVT LIMITED	INDIGENOUS	
	M/s	R.D. ENGINEERS (INDIA) PVT LTD	INDIGENOUS	
	M/s	TEAMCO HITECH ENGINEERING LTD	INDIGENOUS	
	M/s	TEMA INDIA LTD	INDIGENOUS	
	M/s	DAEBONG ACROTEC CO.LTD	FOREIGN	

	M/s	DAEKYUNG MACHINERY & ENGINEERING CO .LTD	FOREIGN	
	M/s	DAEKYUNG TECHNOS CO LTD (SOUTH KOREA)	FOREIGN	
	M/s	DOOSAN ENGINEERING & CONSTN .CO .LTD	FOREIGN	
	M/s	FEM HUDSON ITALIANA S.P.A.	FOREIGN	
	M/s	HANTHCH LIMITED	FOREIGN	
	M/s	OFMECO SPA	FOREIGN	
	M/s	ROLLE S.P.A.	FOREIGN	
	M/s	SUNGJIN GEOTECHCO LTD	FOREIGN	
	M/s	GEMINI ENGI-FAB LIMITED, VALSAD, GUJARAT		
	M/s	UNIQUE CHEMOPLANT EQUIPMENTS, MUMBAI		
<b>62</b>	<b>HEAT EXCHANGERS-SHELL-TUBE TEMA CODE</b>			
	M/s	BHPV, VISAKHAPATNAM		
	M/s	EBM - HUDSON, ITALY		
	M/s	IMB (INDUSTRIE MECCHANIE DE BANGNALO SPA) , ITALY		
	M/s	NUOVO PIGNONE SPA, ITALY		
	M/s	OLMI SPA, ITALY		
	M/s	HHI, KOREA		
	M/s	BELLELI ENERGY SRL, ITALY		
	M/s	L&T		
	M/s	KAVERY		
	M/s	BELCH ENERGY, SRL		
	M/s	GEI HAMON INDUSTRIES LTD, BHOPAL (FOR GAS COOLERS)		
	M/s	FAI, SPA, BERGAMO		
	M/s	BUKIT FRASER THERMAL TECHNOLOGY SDN BHD, MALAYSIA		
	M/s	GODREJ & BOYCE MFG. CO. LTD		
	M/s	GR ENGINEERING WORKS, BANGALORE		
	M/s	ISGEC,		
	M/s	TEMA INDIA LTD.		
	M/s	INDCON PROJECTS & EQUIPMENT LIMITED, NEW DELHI		

	M/s	UNIQUE CHEMOPLANT EQUIPMENTS, MUMBAI		
<b>63</b>	<b>PNEUMATIC PUMPS</b>			
	M/s	HASKEL ENERGY, USA		
	M/s	NIKKISO, JAPAN		
<b>64</b>	<b>FUEL GAS CONDITIONING AND COMPRESSORS</b>			
	M/s	PETRECO INTERNATIONAL LTD UK		
	M/s	OIL & GAS SYSTEMS LTD UK		
	M/s	INGERSOLL RAND USA.		
	M/s	CENATCO UK		
	M/s	IHI JAPAN.		
	M/s	AXSIA SERCK BAKER UK		
	M/s	ALEN PROCESS LTD UK.		
	M/s	FRAMES PROCESS SYSTEM, B.V (Fabrication facility to be approved by the Company at the time of Execution)		
	M/s	TEXAS SYSTEMS & CONTROLS, USA		
	M/s	GLOBAL PROCESS SYSTEM INC., DUBAI / MALAYSIA		
<b>65</b>	<b>GAS CONDITIONING SKID</b>			
	M/s	GRAND PRIX ENGG. PVT. LTD, DELHI		
	M/s	NIRMAL INDUSTRIAL CONTROL PVT LTD	INDIGENOUS	UPTO 20" 600ANSI CLASS
<b>66</b>	<b>HVAC</b>			
	M/s	TISDALE USA		
	M/s	SPECIALITY SERVICES UAE		
	M/s	DIRECT ENGINEERING SERVICES AUSTRALIA		
	M/s	ABB		
	M/s	NAMERI		
	M/s	HVAC & REFRIGERATION ENGINEERING LTD., ABERDEEN, SCOTLAND		
	M/s	HI-PRES, KOREA		
<b>67</b>	<b>AIR CONDITIONING SYSTEM-CENTRAL</b>			
	M/s	BLUE STAR LTD	INDIGENOUS	RECIPROCATING : FREON AND AMMONIA



	M/s	VOLTAS LIMITED	INDIGENOUS	WORKS: DADRA AND NAGAR HAVELI AND RECIPROCATING : FREON AND AMMONIA
<b>68</b>	<b>AIR CONDITIONING SYSTEM-PACKAGE UNIT</b>			
	M/s	VENDOR	INDIGENOUS/FOREIGN	REMARKS
	M/s	AIR PERFECTION	INDIGENOUS	
	M/s	BATLIBOI & CO LTD	INDIGENOUS	
	M/s	BLUE STAR LTD	INDIGENOUS	DADRA WORKS APPD UPTO 15 TONS
	M/s	VERTIV ENERGY PRIVATE LTD, THANE	INDIGENOUS	PRECISION TYPE ONLY
	M/s	ETA ENGINEERING PVT LTD	INDIGENOUS	CAPACITY: 1. DUCTABLE SPLIT UNIT-3 TO 16 TR 2. PACKAGE UNIT-5.5 TO 16 TR
	M/s	VOLTAS LIMITED	INDIGENOUS	WORKS: DADRA AND NAGAR HAVELI
<b>69</b>	<b>VENTILATION &amp; PRESSURISATION SYSTEM</b>			
	M/s	ADVANCE VENTILATION PVT LTD	INDIGENOUS	APPLICATION-SAFE AREA
	M/s	S K SYSTEMS PVT LTD	INDIGENOUS	
	M/s	VOLTAS LIMITED	INDIGENOUS	WORKS:DADRA AND NAGAR HAVELI,1000 TO 45000CFM
<b>70</b>	<b>PROCESS GAS COMPRESSOR - API 617</b>			
	M/s	KHI , JAPAN		
	M/s	IHI, JAPAN		
	M/s	DRESSER RAND, USA		
	M/s	COOPER ENERGY SERVICES, USA		

	M/s	MAN TURBO GERMANY		
	M/s	ELLIOTT (NOW OWNED BY EBARA - JAPAN)		
	M/s	SOLAR TURBINES INC., USA		
	M/s	BHEL INDIA		
	M/s	DEMAG-DE LAVAL (SIEMENS AG, GERMANY), GERMANY		
	M/s	Hitachi Ltd, Japan		
<b>71</b>	<b>GAS TURBINE- API 616</b>			
	M/s	GENERAL ELECTRIC, USA		
	M/s	ROLLS-ROYCE, UK		
	M/s	ALSTOM, UK (SIEMENS AG, GERMANY) GERMANY		
	M/s	SOLAR TURBINES, USA		
<b>72</b>	<b>TURBINE GENERATOR SET</b>			
<b>a.</b>	<b>ALTERNATORS</b>			
	M/s	BRUSH ELECTRIC, UK		
	M/s	GENERAL ELECTRIC, USA		
	M/s	SIEMENS, GERMANY		
	M/s	ALSTOM, UK		
	M/s	FUJI ELECTRIC, JAPAN		
<b>b.</b>	<b>GAS TURBINE</b>			
	M/s	GENERAL ELECTRIC, USA		
	M/s	ROLLS-ROYCE, UK		
	M/s	ALSTOM, UK (SIEMENS AG, GERMANY) GERMANY		
	M/s	SOLAR TURBINES, USA		
<b>73</b>	<b>AIR FIN COOLERS-(CS &amp; SS)</b>			
	M/s	GEA ENERGY SYSTEMS INDIA LTD.		
	M/s	GEI HAMON INDUSTRIES LTD.		
	M/s	L&T LTD.		
	M/s	NUOVO PIGNONE SPA ITALY, INDIA		
	M/s	PAHARPUR COOLING TOWERS		
	M/s	BHARAT HEAVY PLATES & VESSELS		
	M/s	BUKIT FRASER THERMAL TECHNOLOGY SDN BHD, MALAYSIA		

	M/s	BGR ENERGY SYSTEMS LIMITED (FORMRLY G120)	INDIGENOUS	
	M/s	BHEL (HYDERABAD)	INDIGENOUS	
	M/s	GEI INDUSTRIAL SYSTEMS LTD	INDIGENOUS	
	M/s	PATELS AIRTEMP (INDIA) LTD	INDIGENOUS	
	M/s	BATIGNOLLES TECHNOLOGIES THERMIQUES BTT	FOREIGN	
	M/s	BATIGNOLLES THERMAL TECH CHANGSHU CO LTD	FOREIGN	
	M/s	BOLDROCCHI SRL	FOREIGN	
	M/s	FBM HUDSON ITALIANA S.P.A.	FOREIGN	
	M/s	JORD INTERNATIONAL PTY LTD.	FOREIGN	
	M/s	S & T CORPORATION	FOREIGN	
	M/s	Enginemates Heat Transfer Pvt Ltd		
<b>74</b>		<b>SILENCER</b>		
	M/s	ACOUSTICS INDIA PVT LTD	INDIGENOUS	
	M/s	BBM ACOUSTIC INDIA PVT LTD	INDIGENOUS	
	M/s	GRAND PRIX ENGG. PVT. LTD, DELHI		
	M/s	INDIRA INDUSTRIES	INDIGENOUS	
	M/s	PR ACOUSTICAL & ENGINEERRING WORKS (P) LTD	INDIGENOUS	
<b>75</b>		<b>WASTE HEAT EXCHANGERS</b>		
	M/s	L & T LTD.		
	M/s	PETRON		
	M/s	BHARAT HEAVY PLATES & VESSELS		
	M/s	TECHNIP INDIA		
	M/s	THERMAX		
	M/s	HITACHI-BABCOCK, JAPAN		
<b>76</b>		<b>MEMBRANE TYPE NITROGEN GENERATOR</b>		
	M/s	CIRMAC B.V., NETHERLANDS		
	M/s	AIR PACK, NETHERLANDS		
	M/s	PARKAR HANNIEN CORP., BALSTON		
	M/s	AIR LIQUIDE		
<b>76 A</b>		<b>PSA TYPE NITROGEN GENERATOR</b>		
	M/s	SPANTECH ENGINEER PRIVATE LIMITED, NAVI MUMBAI		
	M/s	INDCON PROJECTS & EQUIPMENT LIMITED		

<b>77</b>	<b>NITROGEN GENERATOR PACKAGE &amp; AIR DRYER PACKAGE</b>			
	M/s	CIRMAC INTERNATIONAL, NETHERLANDS		
<b>78</b>	<b>AIR/ HC GAS DRIVEN PUMP</b>			
	M/s	HASKEL ENERGY, UK / HASKEL (ASIA PVT.LTD.),UK		
<b>79</b>	<b>ELECTRO CHLORINATOR</b>			
	M/s	SEVENTRENT DENORA, NETHERLANDS		
<b>80</b>	<b>HYDROCYCLONE</b>			
	M/s	AXSIA SERCK BAKER LTD., UK.		
<b>81</b>	<b>CO2 SNUFFING SYSTEM</b>			
	M/s	NEW AGE INDUSTRIES, MUMBAI		
<b>82</b>	<b>DRY CHEMICAL SKID (UL LISTED)</b>			
	M/s	ANSUL FIRE PROTECTION SYSTEM		
	M/s	SAFETY & HEALTH		
	M/s	WORMALD		
	M/s	FIRE BOSS		
	M/s	VIJAY FIRE		
	M/s	FIRE COMBAT		
	M/s	ANSUL		
<b>83</b>	<b>PORTABLE FIRE EXTINGUISHERS</b>			
	M/s	KOOVERJEE DEVSHI & COMPANY PVT. LTD		
	M/s	WORMALD FIRE ENGG.		
	M/s	HOUSTON FIRE EQUIP. CO.		
	M/s	DOOPLEY FIRE SYSTEM INC.		
	M/s	ZENETH FIRE SERVICE MUMBAI		
	M/s	MERCANTILE & MARINE SERVICE, MUMBAI		
	M/s	SAFEX FIRE SERVICES LTD.		
<b>84</b>	<b>EYE WASH AND SAFETY SHOWER</b>			
	M/s	UNICARE EMERGENCY EQUIPMENTS, MUMBAI		
	M/s	OFFSHORE CLOTHING & SUPPLIERS LTD., UK.		
	M/s	NIPPON ENCON. MFG.CO.LTD.,JAPAN.		
<b>85</b>	<b>PERSONNEL PROTECTION EQUIPMENT FROM H2S EXPOSURE</b>			

	M/s	WORMALD FIRE ENGG., USA.		
	M/s	B DOOLEY FIRE SYSTEMS INC., USA.		
	M/s	C NOHMI FIRE SAFETY EQUIPT.CO., USA.		
	M/s	D HOUSTON FIRE SAFETY EQUIPT. CO., USA.		
	M/s	E DRAGER AKTIENGESELL SCHAFT, GERMANY		
	M/s	F AMCO, USA.		
	M/s	G NOHMI BOSAI KOGYO LTD., JAPAN		
<b>86</b>	<b>COALESCER</b>			
	M/s	GRAND PRIX ENGG. PVT. LTD, DELHI		CAN SUPPLY COALESCER PACK (INTERNAL S) IN SS/FIBRE GLASS/ASPEN WOOD
	M/s	MULTITEX FILTRATION ENGINEERS LTD	INDIGENOUS	
	M/s	PETROMAR ENGINEERED SOLN.P LTD-FORM.R166	INDIGENOUS	
	M/s	JFC CORPORATION	FOREIGN	
	M/s	NATCO UK LIMITED (CAMEROUP GROUP COMPANY)	FOREIGN	
	M/s	PECO FACET	FOREIGN	
	M/s	PEERLESS MFG. CO., USA (Through Peerless Process Systems Pvt Ltd India)	FOREIGN	
<b>87</b>	<b>SCRUBBERS-SPRAY TYPE</b>			
	M/s	HINDUSTAN DORR-OLIVER LTD	INDIGENOUS	
	M/s	INDUSTRIAL AIR CONTROL (I) PVT LTD	INDIGENOUS	
	M/s	THERMAX LIMITED	INDIGENOUS	
<b>88</b>	<b>SCRUBBERS-VENTURI TYPE</b>			
	M/s	HINDUSTAN DORR-OLIVER LTD	INDIGENOUS	
<b>89</b>	<b>LINING (RUBBER)</b>			
	M/s	CORI ENGINEERS PVT LTD	INDIGENOUS	APPD. FOR SITE WORK ALSO
	M/s	LATHIA RUBBER MFG CO	INDIGENOUS	
	M/s	LEBRACS RUBBER LININGS PVT LTD	INDIGENOUS	
	M/s	MIL INDUSTRIES LIMITED	INDIGENOUS	

	M/s	POLY RUBBER PRODUCTS	INDIGENOUS	
	M/s	SHRI RAM RUBTECH PRIVATE LIMITED	INDIGENOUS	DIA 3M & LENGTH 5 M
	M/s	SRM EXOFLEX PVT LTD	INDIGENOUS	
	M/s	TEGA INDUSTRIES LTD	INDIGENOUS	
<b>90</b>	<b>LINING-FRP (TANKS &amp; VESSELS)</b>			
	M/s	CARBORUNDUM UNIVERSAL LTD- PRODORITE DIVN	INDIGENOUS	
	M/s	CHEMICAL PROCESS EQPTS.PVT. LTD.	INDIGENOUS	
	M/s	DOLF INDUSTRIES	INDIGENOUS	
	M/s	EPP COMPOSITE PVT LTD	INDIGENOUS	
	M/s	FIBRO PLASTICHES (I) PVT LTD	INDIGENOUS	
	M/s	GANDHI & ASSOCIATES	INDIGENOUS	
	M/s	INDUSTRIAL SERVICES	INDIGENOUS	
	M/s	MUNDOZ CORPORATION	INDIGENOUS	
	M/s	POLY PLAST CHEMI-PLANT (I) PVT LTD	INDIGENOUS	PVC/PE/PP
	M/s	RUIA CHEMICALS P. LTD.	INDIGENOUS	UPTO 20KL CAPACITY
	M/s	SUNRISE INDUSTRIES (INDIA) LTD	INDIGENOUS	
<b>91</b>	<b>LINING (PVC/PE/PP)</b>			
	M/s	CHEMICAL PROCESS EQPTS PVT LTD	INDIGENOUS	
	M/s	DOLF INDUSTRIES	INDIGENOUS	
	M/s	GANDHI & ASSOCIATES	INDIGENOUS	
	M/s	POLY PLAST CHEMI-PLANT (I) PVT LTD	INDIGENOUS	UPTO DIA 2.5 M AND WT 10MT
	M/s	SUNRISE INDUSTRIES (INDIA) LTD	INDIGENOUS	UPTO DIA 2.5 M AND WT 10MT
<b>92</b>	<b>ELECTRIC HEATER</b>			
	M/s	ESCORTS LIMITED	INDIGENOUS	
	M/s	SANDVIK ASIA PVT LTD-KANTHAL DIVISION	INDIGENOUS	
	M/s	CHEMTEC PTE LTD	FOREIGN	
	M/s	ETIREX CHROMALOX	FOREIGN	
	M/s	KLOPPER THERM GMBH & KG	FOREIGN	
	M/s	TERMoeLECTRICA VILA, S.A	FOREIGN	

	M/s	WATLOW ELECTRIC MFG. COMPANY	FOREIGN	
<b>93</b>	<b>DEMISTER-WIRE MESH TYPE</b>			
	M/s	CONTINENTAL PROFILES LTD	INDIGENOUS	
	M/s	EVERGREEN TECHNOLOGIES PVT LTD	INDIGENOUS	
	M/s	HAVER STAND INDIA PVT LTD	INDIGENOUS	
	M/s	KOCH CHEMICAL TECH. GROUP INDIA PVT LTD	INDIGENOUS	
	M/s	PACE ENGINEERING INDUSTRIES PVT LTD	INDIGENOUS	
	M/s	MUNTERS EUROFORM GMBH	FOREIGN	
<b>94</b>	<b>DEMISTER-VANE TYPE</b>			
	M/s	GRAND PRIX ENGG. PVT. LTD, DELHI		
	M/s	KOCH CHEMICAL TECH. GROUP INDIA PVT LTD	INDIGENOUS	
	M/s	SULZER INDIA LTD	INDIGENOUS	
	M/s	MUNTERS EUROFORM GMBH	FOREIGN	
<b>95</b>	<b>DISHED ENDS PRESS CARBON STEEL</b>			
	M/s	ANUP ENGINEERING LIMITED	INDIGENOUS	
	M/s	B.K.T. SPIN DISH PVT LTD	INDIGENOUS	
	M/s	DISH INDIA PVT LTD	INDIGENOUS	
	M/s	HIRALA DISHED ENDS WORKS PVT LIMITED	INDIGENOUS	
	M/s	ICEM ENGINEERING COMPANY LTD	INDIGENOUS	
	M/s	INDCON PROJECTS & EQUIPMENT LIMITED, NEW DELHI	INDIGENOUS	
	M/s	KCP LIMITED	INDIGENOUS	
	M/s	MOTILAL DISHED-ENDS WORKS PVT LTD	INDIGENOUS	
	M/s	SATYA FABRICATORS PVT LTD	INDIGENOUS	
	M/s	STEELFIT ENGRINEERING COMPANY	INDIGENOUS	
<b>96</b>	<b>DISHED ENDS PRESS STAINLESS STEEL</b>			
	M/s	ANUP ENGINEERING LIMITED	INDIGENOUS	
	M/s	DISH INDIA PVT LTD	INDIGENOUS	
	M/s	HIRALA DISHED ENDS WORKS PVT LIMITED	INDIGENOUS	
	M/s	ICEM ENGINEERING COMPANY LTD	INDIGENOUS	

	M/s	MOTILAL DISHED-ENDS WORKS PVT LTD	INDIGENOUS	
	M/s	SATYA FABRICATORS PVT LTD	INDIGENOUS	
<b>97</b>	<b>DISHED ENDS (SPUN)-CARBON STEEL</b>			
	M/s	ANUP ENGINEERING LIMITED	INDIGENOUS	
	M/s	B.K.T. SPIN DISH PVT LTD	INDIGENOUS	
	M/s	DYNAMIC DISH INDIA PVT LTD	INDIGENOUS	
	M/s	HIRALAL DISHED ENDS WORKS PVT LIMITED	INDIGENOUS	
	M/s	INDCON PROJECTS & EQUIPMENT LIMITED, NEW DELHI	INDIGENOUS	
	M/s	KCP LIMITED	INDIGENOUS	
	M/s	STEELFIT ENGINEERING COMPANY	INDIGENOUS	
	M/s	STEELFIT ENGRINEERING COMPANY	INDIGENOUS	
<b>98</b>	<b>DISHED ENDS (SPUN) –STAINLESS STEEL</b>			
	M/s	ANUP ENGINEERING LIMITED	INDIGENOUS	
	M/s	DYNAMIC DISH INDIA PVT LTD	INDIGENOUS	
	M/s	HIRALAL DISHED ENDS WORKS PVT LTD	INDIGENOUS	
	M/s	INDIA TANKS & VESSELS (P) LTD	INDIGENOUS	
	M/s	KCP LIMITED	INDIGENOUS	
	M/s	MOTILAL DISHED-ENDS WORKS PVT LTD	INDIGENOUS	
	M/s	STEELFIT ENGINEERING COMPANY	INDIGENOUS	
<b>99</b>	<b>SECONDARY SEAL FLOATING ROOF TANK</b>			
	M/s	SAI TOOLS	INDIGENOUS	
<b>100</b>	<b>GAS DEHYDRATION UNIT</b>			
	M/s	GASTECH USA		
	M/s	INDICON PROJECTS & EQUIPMENT LTD, NEW DELHI		
	M/s	MULTITEX FILTRATION ENGINEERS LTD., NEW DELHI	INDIGENOUS	
	M/s	OSWAL INFRASTRUCTURE LIMITED		
<b>101</b>	<b>LOADING ARM</b>			
	M/s	WOODFIELD SYSTEM INDIA PVT. LTD. MUMBAI	INDIGENOUS	
	M/s	STEELFAB ENGINEERING PVT. LTD PUNE	INDIGENOUS	
<b>102</b>	<b>INDUCED GAS FLOATATION (IGF)</b>			



	M/s	SPEC LTD		
	M/s	KVAERNER LTD		
	M/s	MERPRO LTD		
	M/s	AXIA LTD		
	M/s	NATCO UK LTD		
	M/s	SIEMENS		
	M/s	NATIONAL OIL WELL PTE LTD SINGAPORE		
<b>103</b>	<b>NUTSHELL FILTERS (NSF)</b>			
	M/s	FILTRA SYSTEMS LTD		
	M/s	SIEMENS		
	M/s	National Oil Well Pte Ltd Singapore		
<b>104</b>	<b>SLUDGE THICKENER</b>			
	M/s	TRIVENI ENGINEERING AND INDUSTRIES LIMITED, NOIDA UP		
<b>105</b>	<b>BELT FILTER PRESS</b>			
	M/s	TRIVENI ENGINEERING AND INDUSTRIES LIMITED, NOIDA UP		
<b>106</b>	<b>CLEAN AGENT SYSTEM</b>			
	M/s	DE's TECHNICO LTD., KOLKATA		

## **PIPING**

<b>1</b>	<b>CS PIPE (WELDED) (1239 &amp; 3589)</b>		
	M/s	KHANDELWAL TUBES	Kept on ' <b>Hold</b> ' as the firm is dealer/stockist
	M/s	SWASTIK PIPES LTD.	
	M/s	LLOYDS METALS & ENGINEERS LTD.	
	M/s	JINDAL PIPES LIMITED	
	M/s	MUKAT PIPES LIMITED	
	M/s	RATNAMANI METALS & TUBES LTD.	
	M/s	STEEL AUTHORITY OF INDIA	
	M/s	SAW PIPES LIMITED	
	M/s	INDUS TUBE LIMITED	
	M/s	SURYA ROSHNI LTD.	
	M/s	THE TATA IRON & STEEL CO. LTD.	
	M/s	WELSPUN CORP LIMITED, MUMBAI	
	M/s	WEST COAST SAW PIPES LTD.	
	M/s	ADVANCE STEEL TUBE, LTD.,	
	M/s	BMW INDUSTRIES LTD.	
	M/s	LALIT PROFILES & STEEL INDUSTRIES LTD.	
	M/s	MAN INDUSTRIES (I) LTD.	
	M/s	MUKAT TANKS & VESSELS LTD.	
	M/s	NORTH EASTERN TUBES LTD.	
	M/s	PSL HOLDING LTD. CHENNAI	
	M/s	SRI SARBATI STEEL TUBES LTD.	
	M/s	SURENDRA ENGG. CO. PVT. LTD. (RAJPURA)	
	M/s	SURENDRA ENGG. CO. LTD. (MUMBAI)	
	M/s	T.I. ENGINEERING (DIV. OF TUBE INVEST. INDIA)	
<b>2</b>	<b>CS PIPE</b>		
	M/s	MAHALAXMI SEAMLESS	
	M/s	MAHARASHTRA SEAMLESS LTD.	
	M/s	BHEL , TRICHY	
	M/s	INDIAN SEAMLESS METAL TUBES LTD.	
	M/s	SAW PIPE LIMITED	
	M/s	KALYANI SEAMLESS METAL TUBES LTD.	
	M/s	THE TATA IRON & STEEL CO. LTD.	
	M/s	WELSPUN CORP LIMITED, MUMBAI	
	M/s	SURYA ROSHNI LTD.	
	M/s	MAN INDUSTRIES (I) LTD.	
	M/s	JINDAL PIPES, NEW DELHI, INDIA	

	M/s	NSC, JAPAN
	M/s	MITSUBISHI, JAPAN
	M/s	MGI, FRANCE
<b>3</b>	<b>S.S. PIPE</b>	
	M/s	RAJENDRA MECHANICAL INDUSTRIES (P) LTD.
	M/s	CHOKSI TUBE CO. LIMITED
	M/s	NUCLEAR FUEL COMPLEX
	M/s	RATNA MANI METAL TUBE
	M/s	DECORA TUBES (P) LTD.
	M/s	HEAVY METALS & TUBES LTD.
	M/s	SAW PIPES LTD.
	M/s	KALINDI, DELHI, INDIA
	M/s	NFC, HYDERABAD, INDIA
	M/s	PRODUCTOS TUBULARS SA, SPAIN
	M/s	Shubhlaxmi Metals and Tubes Pvt Ltd - Seamless Size %" NB to 8" NB
	M/s	SURAJ LIMITED, MUMBAI ( Up-to 8Inch Size, Sch.-40.)
	M/s	MAXIM TUBES COMPANY PVT. LTD., GANDHINAGAR (GUJARAT) For SS Seamless Pipes.
	M/s	ASR MET TECH PRIVATE LTD., AHMEDABAD
	M/s	KRYSTAL GLOBAL ENGINEERING LIMITED ,VADODARA ( up to 323 MM)- For Piping application only
	M/s	Divine Tubes Pvt Ltd
<b>4</b>	<b>RUBBER LINED PIPE</b>	
	M/s	KRR ENGINEERS PVT. LIMITED
	M/s	LEBRACS RUBBER LINING
	M/s	MIL IND. LIMITED
<b>5</b>	<b>FRP / HDPE PIPE</b>	
	M/s	BALAJI PIPES
	M/s	STRATEGIC ENGINEERING, CHENNAI
	M/s	PENNWALT, BARODA
	M/s	COMPOSITE INC., MUMBAI
	M/s	CHEMICAL PROCESS PIPING PVT. LTD., VADODARA (For Pipe and Fittings)
	M/s	SANGIR PLASTICS PRIVATE LIMITED, MUMBAI
<b>6</b>	<b>CS AND SS PIPE FITTING</b>	
	M/s	EBY INDUSTRIES
	M/s	ECHJAY INDUSTRIES PVT. LIMITED
	M/s	TEEKAY TUBES (P) LIMITED
	M/s	STEWARTS AND LLOYDS,
	M/s	NITIN PROFILES (P) LIMITED

	M/s	M.S. FITTINGS MFG. CO. PVT. LTD.	
	M/s	SIDHARTH & GAUTAM ENGINEERS	
	M/s	EBY FASTENERS	
	M/s	COMMERCIAL SUPPLYING AGENCY	
	M/s	LEADERS VALVES LTD.	
	M/s	M.S. FITTINGS MFG. CO. PVT. LTD.	
	M/s	SHIVANANDA PIPE FITTINGS,CHENNAI (ONLY SEAMLESS)	
	M/s	COMMERCIAL SUPPLYING AGENCIES, MUMBAI	
	M/s	PRECISION FORGING	
	M/s	FORGED INDUSTRIAL CORP	
	M/s	TUBE PRODUCTS, BARODA	
	M/s	PIPE FIT ENGINEERS ,VADODARA (FOR CS,NON-NACED BUT WELDED FITTINGS, BW ELBOWS REDUCERS/TEE/CAP (SEAMLESS/WELDED)	
	M/s	TUBE PRODUCTS INCORPORATE	
	M/s	SAWAN ENGINEERS	
	M/s	GUJARAT INFRA PIPES, MUMBAI,	
	M/s	ALLIED INTERNATIONAL S.R.L	
	M/s	EBY FASTENERS (SOCKET WELDED FITTINGS FOR SIZES LESS THAN 2")	
	M/s	T K CORPORATION, KOREA	
	M/s	Tube Bend Calcutta Pvt. Ltd	
	M/s	PIPEFIT ENGINEERS PVT. LIMITED, VADODARA	
	M/s	ANGGERIK LAKSANA (I) PVT. LTD, HANOLI,DIST-UNA-174301,HP	
	M/s	FitTech Industries Pvt Ltd,VASAI-401208,MAHARASTRA	
	M/s	YINGKOU LIAOHE PIPE FITTINGS CO. LTD., PR CHINA	
	M/s	PERFECTT SERVICES (MADRAS), CHENNAI- (For CS Pipe Fittings only)	
	M/s	REAL FORGE & FITTINGS, VASAI (E)	1. CS Pipe Fitting: up to size 46" and Sch XS, size up to 8" and up to XXS 2. SS Pipe Fitting: up to size 8" and Sch up to 10 S, up to size 4" and Sch up to 40 S & size up to 1.5" and Sch up to 80 S
<b>7</b>	<b>CS AND SS FORGED FLANGE</b>		
	M/s	ADITYA FORGE LTD.	
	M/s	ANANDMAYEE FORGING (P) LTD.	
	M/s	PUNJAB STEEL WORKS	
	M/s	ECHJAY FORGINGS PVT. LTD.	
	M/s	GOLDEN IRON AND STEEL WORKS	
	M/s	CHOUDHURY HAMMER WORKS PVT. LTD.	
	M/s	FORGE AND FORGE PVT. LTD.	
	M/s	INDUSTRIAL FORGE & ENGG. CO. LTD.	
	M/s	JAV FORGING PVT. LTD.	
	M/s	SIDHARTH & GAUTAM ENGINEERS PVT. LTD.	
	M/s	KUNJ FORGINGS	

	M/s	METAL FORGINGS PVT. LTD.	
	M/s	UMA SHANKAR KHANDELWAL & CO.	
	M/s	STEEL & INDUSTRIAL & FORGINGS LTD.	
	M/s	AMFORGE INDUSTRIES LTD.	
	M/s	BRIDGE & ROOF CO. (I) LTD.	
	M/s	BRITEX ENGINEERING WORKS	
	M/s	CD ENGINEERING CO.	
	M/s	CD INDUSTRIES, GHAZIABAD	
	M/s	MOD FABRICATORS	
	M/s	PRADEEP METAL LTD.	
	M/s	RP ENGINEERING PVT. LTD.	
	M/s	ECHJAY INDUSTRIES, MUMBAI /RAJKOT,	
	M/s	PARAMOUNT FORGE, MUMBAI,	
	M/s	TUBE PRODUCTS INCORPORATE, VADODARA,	
	M/s	SAWAN ENGINEERS	
	M/s	LAL METAL FORGE LTD. - FOR SIZES UP TO 8" - CLASS UP TO #2500 - FOR SIZE 10" - CLASS UP TO #600 - FOR SIZE 10" TO 60" - CLASS UP TO #300	
	M/s	FITTECH INDUSTRIES PVT LTD, VASAI-401208,MAHARASTRA	
	M/s	ANGGERIK LAKSANA (I) PVT. LTD, HANOLI,DIST-UNA-174301,HP	
	M/s	REAL FORGE & FITTINGS, VASAI (E)	1. CS Forged Flanges of size up to 36" 150 class, 22" 300 Class 14" 600 Class, 4" 900 Class & 6" 1500 Class 2. SS Forged Flanges of 10" 300 Class
8	GATE, GLOBE & CHECK VALVE (CS AND SS)		
	M/s	L&T Valves Ltd. India	
	M/s	KSB PUMPS LTD. , COIMBATTORE	
	M/s	AUTOMECH ENGINEERS PVT. LTD.	
	M/s	AV VALVES LTD.	
	M/s	BHEL, TRICHY	
	M/s	FOURESS ENGINEERING(INDIA) PRIVATE LIMITED, MUMBAI	
	M/s	DEWRANCE & MECHNEILL LTD.	
	M/s	BDK ENGINEERING INDUSTRIES LTD.	
	M/s	NITON VALVE INDUSTRIES PVT. LTD.	
	M/s	SAKHI ENGINEERS (PVT.) LTD.	
	M/s	PRECISION ENGINEERS PVT. LTD.	
	M/s	NECO SCHUBER & SALZER LEADER VALVES	
	M/s	STEEL STRONG VALVES (I) PVT. LTD.	
	M/s	AKSONS MECHANICAL ENTERPRISES	
	M/s	LEADER VALVES LTD.	
	M/s	OSWAL INDUSTRIES LTD.	
	M/s	PANCHVATI VALVES & FLANGES PVT. LTD.	

	M/s	PETRO CHEMICAL ENGINEERING ENTERPRISES.	
	M/s	SHALIMAR VALVES PVT. LTD.	
	M/s	TMT ENGG. INDUSTRIES LTD.	
	M/s	COOPER CAMERON VALVES, USA	
	M/s	DRESSER SPA, ITALY	
	M/s	KTM, JAPAN	
	M/s	DEUTACH AUDCO, GERMANY	
	M/s	KITZ, JAPAN	
	M/s	SERCK, AUDCO VALVES INTERNATIONAL, U.K	
	M/s	FLOW CONTROL TECHNOLOGY, FRANCE	
	M/s	CRANE, USA	
	M/s	ORBIT VALVE , UK	
	M/s	T.K.VALVES, ABU DHABI, UAE	
	M/s	OMX SPA, ITALY	
	M/s	PETROL VALVES, ITALY	
	M/s	VALVINOX, ITALY	
	M/s	UNIVERSAL SRL, ITALY	
	M/s	LVF, ITALY	
	M/s	BFE SPA, ITALY	
	M/s	SACCAP, FRANCE	
	M/s	FLOW SERVE FLOW CONTROL, GMBH GERMANY	
	M/s	GOODWIN INTERNATIONAL LIMITED, ENGLAND (Wafer Check valves only)	
	M/s	ARGUS, WEST GERMANY	
	M/s	CAMERON IRON WORKS, USA	
	M/s	FORWARD ALLOYS & CASTINGS, MUMBAI (For Check valves CS up to size 6" x 900#)	
	M/s	DOUGLUS CHERO SPA, ITALY (Up to 8" size)	
	M/s	TYCO VALVES AND CONTROLA ITALIA S.R.L	DO NOT MANUFACTURE MOV. APPLICABLE FOR -GATE VALVE (THRU CONDUIT) (API 6D)
	M/s	Z &J TECHNOLOGIES GMBH	DO NOT MANUFACTURE MOV. APPLICABLE FOR -GATE VALVE (THRU CONDUIT) (API 6D)
	M/s	HAWA ENGINEERS LTD, AHMEDABAD	<ul style="list-style-type: none"> <li>- CS GATE VALVES UP TO 400 MM NB CLASS 150</li> <li>- CS GATE VALVE UP TO 200 MM NB CLASS 1500</li> <li>- CS CHECK VALVES UP TO 200MM NB CLASS 1500</li> </ul>
	M/s	STAR ENGINEERS, AHMEDABAD	<ul style="list-style-type: none"> <li>- GATE VALVE (CS &amp; SS)-UP TO CLASS 600# - UP TO 18"</li> </ul>

			<ul style="list-style-type: none"> <li>- GLOBE VALVE (CS &amp; SS) (a) UP TO CLASS 600# - UP TO 8", (b) UP TO CLASS 2500# -UP TO 4"</li> <li>- CS GATE VALVES OF UP TO 6" FOR UP TO CLASS 1500</li> <li>- CS CHECK VALVES OF UP TO 4" FOR UP TO CLASS 900</li> <li>- CS CHECK VALVES OF UP TO 2" FOR CLASS 1500</li> </ul>
	M/s	GM ENGINEERING PVT LTD, RAJKOT	(1) Gate Valve: Class 150# - up to 32" (2) Gate Valve: Class 600# - up to 16" (3) Check Valve: Class 150# - up to 20" (4) Globe Valve: Class 150# - up to 14" (5) Gate, Globe & Check Valve: Class up to 800# - up to 2" (6) Globe & Check Valves: Class up to 600# - 4" (7) Gate, Globe & Check Valve: Class up to 300# - Size 6" & 8".
	M/s	NU-TECH CONTROLS, AHMEDABAD	CS GATE VALVE: 1 INCH 800#, UPTO 14 INCH 300#. CS GLOBE VALVE: 1INCH 800#, UPTO 8 INCH 150#.
	M/s	STAR ENGINEERING PVT LTD,AHEMDABAD-380023	
	M/s	PETRO VALVES PVT LTD,AHEMDABAD-382415	(FOR GLOBE AND CHECK VALVES ONLY)
	M/s	M H VALVES, PVT LTD., AHMEDABAD	
<b>9</b>	<b>GATE, GLOBE &amp; CHECK VALVE (NACE</b>		
	M/s	SHAYBURG VALVES PRIVATE LIMITED, MUMBAI	
	M/s	SHAYBURG VALVES PRIVATE LIMITED, AHMEDABAD (Globe Valves of size 2" Class 600)	
<b>10</b>	<b>BALL VALVE (CS AND SS)</b>		
	M/s	L&T Valves Ltd. India	
	M/s	VIRGO ENGINEERS LTD.	
	M/s	FISHER XOMOX SANMAR LTD.	
	M/s	BDK ENGINEERING INDUSTRIES LTD.	
	M/s	FLOWCHEM INDUSTRIES	
	M/s	NITON VALVE INDUSTRIES PVT. LTD.	
	M/s	AUTOMECH ENGINEERS PVT. LTD.	



	M/s	MICROFINISH VALVES LTD.	
	M/s	KSB PUMPS LTD. , COIMBATTUR	
	M/s	HAWA ENGINEERS LTD, AHMEDABAD	CS BALL VALVE UP TO 100 MM NB CLASS 150
	M/s	GM ENGINEERING PVT LTD	SIZE UP TO 1 %" - CLASS UP TO #150
	M/s	NSSL ITALIA S.R.L	UP TO 300#
	M/s	PETRO VALVES PVT LTD,AHEMDABAD-382415	
	M/s	M H VALVES, PVT LTD., AHMEDABAD	
	M/s	BELGAUM AQUA VALVES PVT. LTD, BELGAUM	1) Ball Valve (CS & SS)-Size;150# - UP TO 30" 2) Ball Valve (CS & SS)-Size;300# - UP TO 20" 3) Ball Valve (CS & SS)-Size;600# - UP TO 14" 4) Ball Valve (CS & SS)-Size;900 & 1500# -UP TO 3"
	M/s	DEMBLA VALVES LIMITED, THANE	Ball Valves (CS & SS) - 1. Size: up to 48" #150 2. Size: up to 36" #300 3. Size: up to 16" #600 4. Size: up to 12" #900 5. Size: up to 2" #1500
	M/s	PHBB VALVES PVT LTD., PUNE	(1) Ball Valve (CS)- (i) ) Size: Up to 20" # 600,  (2) Ball Valve (CS & SS)- (i) ) Size: Up to 2" # 2500, (ii) Size: Up to 10" # 900,
	M/s	STAR ENGINEERS, AHMEDABAD	Ball Valve (CS only) - (a) Up to class 900# - up to 8" (b) Up to class 1500# - up to 2"
<b>11</b>	<b>BALL VALVE (CS NACE)</b>		
	M/s	COOPER CAMERON VALVES, USA	
	M/s	DRESSER SPA, ITALY	
	M/s	KTM, JAPAN	
	M/s	DEUTACH, AUDCO GERMANY	
	M/s	FLOWERVE FLOW CONTROL, GMBH GERMANY	

	M/s	KITZ, JAPAN	
	M/s	SERCK AUDCO VALVES INTERNATIONAL, U.K.	
	M/s	FLOW CONTROL TECHNOLOGY, FRANCE	
	M/s	CRANE, USA	
	M/s	ORBIT VALVE, U.K.	
	M/s	T.K. VALVE, ABU DHABI, UAE	
	M/s	OMB SPA. SPAIN (upto 1.5")	
	M/s	PETROL VALVES, ITALY	
	M/s	VALVINOX, ITALY	
	M/s	UNIVERSAL SRI.NACE BALL VALVE, ITALY (4" & below)	
	M/s	LCM, ITALIA SRL, ITALY	
	M/s	MULTI VALVE TECHNOLOGY, UK	
	M/s	RAIMONDI, ITALY	
	M/s	WALTHER WEIR, SPAIN	
	M/s	NISHITANI & CO, JAPAN	
	M/s	YONEDA KOGYO CO, JAPAN	
	M/s	TRUFLO RONA S.A, BELGIUM	
	M/s	VIRGO ENGINEERS LTD., PUNE INDIA	
	M/s	ARGUS WEST, GERMANY	
	M/s	CAMERON IRON WORKS, USA	
	M/s	O.M.S. SALERI, ITALY	
	M/s	EMERSON PROCESS MANAGEMENT INDIA PVT. LTD. PUNE (OFFSHORE SVL)	
	M/s	PHBB VALVES PVT LTD, PUNE	1. 600# up to 20" 2. 900# up to 10" 3. 2500# up to 12" 4. All classes below 600# up to
<b>12</b>	<b>BALL VALVES - CS NON-NACE</b>		
	M/s	L&T Valves Ltd. India	
	M/s	FORWARD ALLOYS & CASTINGS, MUMBAI (upto 8"X900#)	
	M/s	VIRGO ENGINEERS LTD., PUNE	
	M/s	MICROFINISH, HUBLI	
	M/s	O.M.S. SALERI, ITALY	
	M/s	OSWAL INDUSTRIES LTD., AHMEDABAD	
	M/s	EMERSON PROCESS MANAGEMENT INDIA PVT. LTD. PUNE (OFFSHORE SVL)	
<b>13</b>	<b>BALL VALVES (SS NACE AND NON NACE)</b>		
	M/s	L&T Valves Ltd. India	
	M/s	VIRGO ENGINEERS LTD., PUNE	
	M/s	VALVINOX S.R.L, ITALY	
	M/s	EMERSON PROCESS MANAGEMENT INDIA PVT. LTD. PUNE (OFFSHORE SVL)	

<b>14</b>	<b>BUTTERFLY VALVE</b>	
	M/s	ALFA LAVAL SAUNDERS
	M/s	BDK ENGINEERING INDUSTRIES LTD.
	M/s	L&T Valves Ltd. India
	M/s	INTERVALVE POONAWALLA LTD., PUNE
	M/s	FOURESS ENGINEERING(INDIA) PRIVATE LIMITED, MUMBAI
	M/s	KEYSTONE (I) PVT. LTD.
	M/s	SEALMAT ENGINEERS.
	M/s	LEADER VALVES LTD.
	M/s	DEWRANCE & MECHNEILL LTD.
	M/s	AVC ENGG. COMPANY PVT. LTD.
	M/s	CRANE PROCESS FLOW TECHNOLOGIES LTD.
	M/s	INSTRUMENTATION LTD. PALGHAT
<b>15</b>	<b>NEEDLE VALVE</b>	
	M/s	LEADER VALVES LTD.
	M/s	EXCELESIOR ENGINEERING WORKS.
	M/s	SWASTIK ENGINEERING WORKS
	M/s	TECHNOMATIC (I) PVT. LTD.
	M/s	TMT ENGINEERING INDUSTRIES LTD.
	M/s	VARALL ENGINEERS
<b>16</b>	<b>NEEDLE VALVES (CS NON-NACE)</b>	
	M/s	SAKHI ENGINEERS, MUMBAI- BARODA
	M/s	CHEMVALVES INDUSTRIES, MUMBAI
	M/s	VALVINOX, ITALY
	M/s	NITON VALVE INDUSTRIES PVT.LTD., MUMBAI
<b>17</b>	<b>NEEDLE VALVES (SS-NACE)</b>	
	M/s	NITON VALVE INDUSTRIES PVT.LTD., MUMBAI
<b>18</b>	<b>HOSE PIPE (STEAM / GAS / AIR / WATER / CHEMICAL)</b>	
	M/s	ASHIT SALES CORPORATION
	M/s	BHARAT RUBBER UDYOG
	M/s	COSMOPOLITE (THE)
	M/s	CROWN RUBBER INDUSTRIES (P) LTD.
	M/s	D. WREN INDUDTRIES PVT. LTD.
	M/s	GAYATRI INDUSTRIES
	M/s	JYOTI RUBBER UDYOG (I) PVT. LTD.
	M/s	MARKWEL HOSE INDUSTRIES PVT. LTD.
	M/s	PRESIDENCY RUBBER MILLS PVT. LTD.
	M/s	ROYAL INDIA CORPORATION (NASIK WORKS)
	M/s	SONI RUBBER PRODUCTS LTD.

	M/s	SRIDHAR RUBBER PRODUCTS PVT. LTD.
	M/s	TAURIAN TUBES
	M/s	UNIQUE RUBBER WORKS
	<b>FW /FM REELS &amp; UTILITY HOSE REELS-(UL/USCG/FM INDIA APPROVAL)</b>	
	M/s	MARINE HYDRAULIC, INDIA
	M/s	ROYAL INDIA CORPORATION, MUMBAI
	M/s	DOOLEY TACKABERRY, USA
<b>19</b>	<b>DIAPHRAGM VALVE (STEEL)</b>	
	M/s	BDK MARKETING SERVICES PVT LIMITED, NEW DELHI
	M/s	INVEST VALVES PVT LIMITED, BANGALORE
<b>20</b>	<b>FLANGES</b>	
	M/s	ECHJAY INDUSTRIES, MUMBAI
	M/s	PUNJAB STEEL, NEW DELHI
	M/s	GOLDEN IRON & STEEL, NEW DELHI
	M/s	FERROUS ALLOY FORGINGS, FARIDABAD
	M/s	STEWARTS & LLOYDS, KOLKATA
	M/s	METAL FORGING PVT. LIMITED, NEW DELHI
	M/s	BHARAT FORGE, PUNE.
	M/s	PIPEFIT ENGINEERS PVT. LIMITED, VADODARA
	M/s	UTSAH ENGINEERING PVT LTD, HAPUR
	M/s	PERFECTT SERVICES (MADRAS), CHENNAI
	M/s	KISAAN STEELS PVT. LTD., GHAZIABAD
<b>21</b>	<b>FLANGES - (DUPLEX SS)</b>	
	M/s	SUMITOMO CORPORATION, JAPAN.
	M/s	SANDVIK , SWEDEN.
	M/s	COPRISIDER SPA, ITALY.
	M/s	MANNESMANN, GERMANY
	M/s	OFFICINE AMBROCIO MELESI & C.SRI, ITALY
	M/s	MGI, FRANCE
	M/s	OFFICINE NICOLA GALPERTI FIGLIO S.P.A, ITALY
	M/s	Utsah Engineering Pvt Ltd, HAPUR
<b>22</b>	<b>FLANGES (C.S NACE)</b>	
	M/s	SUMITOMO, JAPAN
	M/s	COPROSIDER SPA, ITALY
	M/s	OFFICINE NICOLA GALPERTI FIGLIO S.P.A, ITALY.
	M/s	TROUVAY & CAUVIN , FRANCE.
	M/s	MELESI , ITALY.
	M/s	OFFICINE AMBROCIO MELESI & C.SRI , ITALY

	M/s	MGI, FRANCE	
	M/s	SCHULZ EXPORT GMBH, GERMANY	
	M/s	SPECIAL FLANGES SRL, ITALY	
	M/s	TUBE PRODUCTS INCORPORATE, INDIA	
	M/s	CHAUDHRY HAMMERS WORKS, GHAZIABAD	
	M/s	KISAAN STEELS PVT. LTD., GHAZIABAD	
<b>23</b>	<b>FLANGES (SS NACE &amp; NON NACE)</b>		
	M/s	ECHJAY INDUSTRIES, MUMBAI	
	M/s	CHAUDHRY HAMMERS WORKS, GHAZIABAD	
	M/s	OFFICINE AMBROCIO MELESI & C.SRI, ITALY	
	M/s	TUBE PRODUCTS INCORPORATE, VADODARA, INDIA	
	M/s	OFFICINE NICOLA GALPERTI FIGLIO S.P.A, ITALY	
<b>24</b>	<b>SW PIPE FITTING</b>		
	M/s	ECHJAY INDUSTRIES PVT. LTD., MUMBAI	
	M/s	EBY, MUMBAI	
	M/s	TRUE FORGE	
	M/s	S&L	
	M/s	COMMERCIAL SUPPLY	
	M/s	M.S. FITTINGS	
	M/s	UNION TOOL	
<b>25</b>	<b>BW FITTING</b>		
	M/s	S&L	
	M/s	BHARAT FORGE	
	M/s	TRUE FORGE	
	M/s	COMMERCIAL SUPPLY	
	M/s	SIVANAND	
	M/s	EBY INDUSTRIES, MUMBAI	
	M/s	TEEKAY TUBES	
	M/s	M.S. FITTINGS	
	M/s	ALLIANCE FORGE INDUSTRIES	
<b>26</b>	<b>VALVE PLUG PRESSURE BALANCED (NFS)</b>		
	M/s	ECONO VALVES LTD( INDIGENOUS)	RATING -UPTO 6"
	M/s	HAWA VALVES (INDIA) PVT LTD(INDIGENOUS)	SIZE - UPTO 6"
	M/s	LARSEN & TOUBRO LTD(INDIGENOUS)	RATING -HAVE API-6D CERTIFICATE
	M/s	FLOWSER PTE(MFR. SERCK)(FOREIGN)	
	M/s	GALLI & CASSINA SPA( FOREIGN)	

<b>27</b>	<b>VALVE PLUG PRESSURE BALANCED (FS)</b>		
	M/s	LARSEN & TOUBRO LTD(INDIGENOUS)	HAVING API -6D CERTIFICATE
	M/s	GALLI & CASSINA SPA (FOREIGN)	
<b>28</b>	<b>Plug Valve (Lubricated)</b>		
	M/s	FLOWSERVE INDIA PVT LTD,MARAIMALAI NAGAR-603209,TN	
<b>NEW CATEGORIES FROM OFFSHORE LIST</b>			
<b>1</b>	<b>PIPE - (DUPLEX SS)</b>		
	M/s	SUMITOMO CORPORATION, JAPAN	
	M/s	KAWASAKI, JAPAN.	
	M/s	NSC, JAPAN.	
	M/s	SANDVIK, SWEDEN	
	M/s	AVESTA, SWEDEN.	
	M/s	MANNESMANN, GERMANY.	
	M/s	NKK, JAPAN.	
	M/s	COPROSIDER SPA, ITALY	
	M/s	SCHULTZ, GERMANY	
<b>2</b>	<b>FITTINGS - (DUPLEX SS)</b>		
	M/s	SUMITOMO CORPORATION, JAPAN.	
	M/s	SANDVIK, SWEDEN.	
	M/s	SHIMODA IRON WORKS CO.LTD., JAPAN.	
	M/s	COPROSIDER SPA, ITALY.	
	M/s	MANNESMANN ROHREN , GERMANY.	
	M/s	NKK JAPAN.	
	M/s	SCHULZ EXPORT GMBH GERMANY	
	M/s	ALLIED INTERNATIONAL S.R.L ITALY	
	M/s	M.E.G.A S.P.A (FORGED FITTINGS ASTM A182 GRADE F60/F51 WITH UNS 31803 / UNS 32205) ITALY	
<b>3</b>	<b>BALL VALVES (DUPLEX SS)</b>		
	M/s	KTM, JAPAN.	
	M/s	KITZ, JAPAN.	
	M/s	DEUTSCH AUDCO ,GERMANY	
	M/s	T.K. VALVES LTD, ABUDHABI, UAE	

	M/s	PETROL VALVES, ITALY	
	M/s	DRESSER SPA , ITALY	
	M/s	FLOWERVE FLOW CONTROL GMBH, GERMANY	
	M/s	VIRGO ENGINEERS LTD.,PUNE(FOR SIZES UP TO 14" & #900 CLASS)	
	M/s	ARGUS WEST, GERMANY	
	M/s	GROVE ITALIA SPA, ITALY	
	M/s	O.M.S. SALERI, ITALY	
	M/s	EMERSON PROCESS MANAGEMENT INDIA PVT. LTD. PUNE (OFFSHORE SVL)	
<b>4</b>	<b>OTHER VALVES (GATE GLOBE, CHECK : DUPLEX SS)</b>		
	M/s	KITZ, JAPAN.	
	M/s	KTM, JAPAN	
	M/s	PETROL VALVES, ITALY	
	M/s	TK VALVE LTD, ABU DHABI, UAE	
	M/s	VALVINOX., ITALY	
	M/s	WEIR MATERIAL & FOUNDARIES LTD, U.K	
	M/s	TRUFLO RONA S.A., BELGIUM	
	M/s	RONA VALVES, BELGIUM	
<b>5</b>	<b>SHUTDOWN VALVES (DUPLEX SS)</b>		
	M/s	KTM, JAPAN	
	M/s	KITZ, JAPAN	
	M/s	DEUTSCH AUDCO, GERMANY	
	M/s	FLOWERVE FLOW CONTROL GMBH, GERMANY	
	M/s	TK VALVES LTD, ABU DHABI, UAE	
	M/s	DRESSER SPA . ITALY	
	M/s	PETROL VALVES ITALY	
	M/s	ARGUS WEST GERMANY	
	M/s	GROVE ITALIA SPA ITALY	
	M/s	ROTEX MANUFACTURING & ENGINEERING Pvt Ltd,DOMBIVILI-421204,MAHARASTRA	
	M/s	EMERSON PROCESS MANAGEMENT INDIA PVT. LTD. PUNE (OFFSHORE SVL)	

<b>6</b>	<b>PIPE (C.S NACE)</b>		
	M/s	SUMITOMO, JAPAN	
	M/s	NKK , JAPAN	
	M/s	NIPPON STEEL CORPORATION, JAPAN	
	M/s	MANNESMANN, GERMANY	
	M/s	MITSUBISHI, JAPAN	
	M/s	DALMINE, SPA ITALY	
	M/s	mitsui & CO.KAWASAKI, JAPAN	
	M/s	RACCORDI FORGIATI, ITALY	
	M/s	KAWASAKI, JAPAN	
	M/s	OMR OFFICINE MECCANICHE, ITALY	
	M/s	SCHULZ EXPORT GMBH, GERMANY	
	M/s	V & M, GERMANY/FRANCE	
<b>7</b>	<b>FITTINGS (C.S. NACE)</b>		
	M/s	SUMITOMO, JAPAN	
	M/s	B MEGA SPA, ITALY	
	M/s	GAM RECORDIE, ITALY	
	M/s	RACCORDIE FORGIATI, ITALY	
	M/s	FITTINOX SRL, ITALY	
	M/s	OMR OFFICINE MECANICHE, ITALY	
	M/s	SCHULZ EXPORT GMBH, GERMANY	
	M/s	COPROSIDER SPA , ITALY	
	M/s	ANGGERIK LAKSANA (I) PVT. LTD, HANOLI,DIST-UNA-174301,HP	
<b>8</b>	<b>SHUTDOWN VALVES - CS NACE</b>		
	M/s	KTM JAPAN	
	M/s	COOPER CAMERON VALVES, USA	
	M/s	KITZ, JAPAN	
	M/s	FLOW CONTROL TECHNOLOGY, FRANCE	
	M/s	CRANE, USA	
	M/s	ORBIT VALVES, UK	
	M/s	T.K.VALVES, ABU DHABI, UAE	
	M/s	TYCO, ITALY	
	M/s	PETROL VALVES, ITALY	
	M/s	DRESSER ITALIA SRL.(GROVE DIVISIONS), ITALY	



	M/s	FLOWSERVE FLOW CONTROL GMBH, GERMANY	
	M/s	L&T Valves Ltd. India	
	M/s	VALVINOX SRL, ITALY	
	M/s	VIRGO ENGINEERS LTD., PUNE INDIA	
	M/s	ARGUS WEST, GERMANY	
	M/s	GROVE ITALIA SPA, ITALY	
	M/s	CAMERON IRON WORKS, USA	
	M/s	ROTEX MANUFACTURING & ENGINEERING Pvt Ltd, DOMBIVILI-421204, MAHARASTRA	
	M/s	EMERSON PROCESS MANAGEMENT INDIA PVT. LTD. PUNE (OFFSHORE SVL)	
<b>9</b>	<b>GLOBE &amp; CHECK VALVE (SS NACE)</b>		
	M/s	L&T Valves Ltd. India	
	M/s	NITON VALVE INDUSTRIES PVT.LTD., MUMBAI, INDIA	
	M/s	DOUGLUS CHERO S.P.A, (UPTO 8" SIZE) ITALY	
<b>10</b>	<b>GATE VALVE (SS NACE)</b>		
	M/s	NITON VALVE INDUSTRIES PVT.LTD., INDIA	
	M/s	DOUGLUS CHERO S.P.A., ITALY	
<b>11</b>	<b>PIPES (CU-NI)</b>		
	M/s	ALCABEX METALS. INDIA	
	M/s	CUBEX TUBING, INDIA	
	M/s	LEBRONZE INDUSTRIAL, FRANCE	
	M/s	WILSON, UK	
	M/s	HAEWON INDUSTRIES CO.LTD., KOREA	
<b>12</b>	<b>PIPES &amp; FITTINGS (CU-NI)</b>		
	M/s	YORKSHIRE IMPERIAL METAL, UK	
	M/s	LE BRONE INDUSTRIAL. FRANCE	
	M/s	DAE YUNG METAL INDUSTRIAL CO, S KOREA	
	M/s	V.D.M., GERMANY	
	M/s	SAM YANG METAL IND.CO.LTD., BUSAN, KOREA	

	M/s	HAEWON INDUSTRIES CO.LTD.,(FOR FLANGES & FITTINGS ONLY UPTO 24"), KOREA	
	M/s	KM EUROPA METAL AKTLENGESELL SCHAFT, (PIPES, FITTINGS & FLANGES), GERMANY	
	M/s	SITINDUSTRIE, ITALY	
<b>13</b>	<b>BALL VALVE (ALUMINIUM BRONZE)</b>		
	M/s	BROOKS BANK LTD, U.K	
	M/s	ORSEAL VALVES, ITALY	
	M/s	PRECISION ENGINEERING, INDIA	
	M/s	VALVINOX S.R.L , ITALY	
<b>14</b>	<b>BALL/ GATE/ GLOBE/ CHECK/ NEEDLE VALVE (AL-BRONZE, LEADED-TIN BRONZE)</b>		
	M/s	SHIPHAM VALVES, UK	
	M/s	DOUGLUS CHERO S.P.A, (GLOBE VALVE-AL BRONZE ONLY), ITALY	
<b>15</b>	<b>CHECK VALVES (AL-BRONZE)</b>		
	M/s	PRECISION ENGINEERING, INDIA	
<b>16</b>	<b>TITANIUM VALVES</b>		
	M/s	SHIPHAM VALVES	
	M/s	DOUGLUS CHERO S.P.A, (CHECK VALVES UPTO 6" SIZE). ITALY	
<b>17</b>	<b>FLANGES(SD/SS INCOLOY/TITANIUM/CS)</b>		
	M/s	OFFICINE AMBROCIO MELESI & C.SRI, ITALY	
	M/s	OFFICINE NICOLA GALPERTI FIGLIO S.P.A, ITALY	
<b>18</b>	<b>BALL VALVES (INCOLLOY)</b>		
	M/s	PETROL VALVES S.R.L, ITALY	
<b>19</b>	<b>BALL VALVE (CPVC/PVC)</b>		
	M/s	GEORGE FISCHER, SWITZERLAND	
<b>20</b>	<b>SHUTDOWN VALVES (CPVC)</b>		
	M/s	GEORGE FISCHER, SWITZERLAND	
<b>21</b>	<b>CORROSION PROBES-(CS NACE, CS NON-NACE)</b>		
	M/s	CASASCO DIVISION , USA	
	M/s	REHRABACK COSASCO , USA	
	M/s	MC MURRAY , USA	
	M/s	CAPROCO, CANADA.	
	M/s	ATEL, ITALY	
	M/s	Emerson Process Management S.R.L.	

<b>22</b>	<b>STRAINER-(BASKET TYPE AS PER ASME SEC VIII DIV 1 AND OTHERS )</b>		
	M/s	ARMSTRONG, USA	
	M/s	MULTITEX ENGINEERS, NEW DELHI, INDIA	
	M/s	GREAVES COTTON, DELHI, INDIA	
	M/s	FILTRATION ENGINEERS (INDIA) PVT LTD, MUMBAI, INDIA	
	M/s	ZED VALVES CO. PVT. LTD. AHMEDABAD	For Y type Strainers up to 14 Inch size for 150# rating.
	M/s	GRAND PRIX ENGG. PVT. LTD, DELHI	
	M/s	DE's TECHNICO LTD., KOLKATA	1) For T-strainer up to 6", 150# rating Body-MS&SS screen basket wire mesh 2) For T-strainer up to 16", 300#
	M/s	SUNGOV ENGINEERING PRIVATE LIMITED, CHENNAI	1) 150# up to 16" 2) 300# up to 2"
<b>23</b>	<b>SPRAY NOZZLES-(NFPA 15 AND APPV. BY UL,USA/VJTI,INDIA)</b>		
	M/s	MARINE HYDRAULICS, INDIA	
	M/s	WORMALD FIRE SYSTEMS, U.K.	
	M/s	HD FIRE PROTECT PVT LIMITED,THANE-400604	
	M/s	DE's TECHNICO LIMITED, HOWRAH	
<b>24</b>	<b>CONTINUOUS DRAINERS</b>		
	M/s	ARMSTRONG MACHINE WORKS, USA	
	M/s	GREAVES COTTON, MUMBAI, INDIA	
<b>25</b>	<b>5D BENDS-(ASME B 31.4 / 31.8)</b>		
	M/s	FABRICOM, BELGIUM	
	M/s	SUNGJIN ,S KOREA	
	M/s	IGAWARA ,SINGAPORE	
	M/s	PSL, KANDLA, INDIA	
	M/s	INDUCTION BENDING, UK	
	M/s	DALMINE, ITALY	
	M/s	DAI CHI, JAPAN	
	M/s	PIPELINE ENGINEERING, UK	
<b>26</b>	<b>CHOKE VALVES</b>		
	M/s	MOKVELD, USA	
	M/s	PETROL VALVES, ITALY	

	M/s	VALVINOX, ITALY	
	M/s	WEIR VALVES & CONTROLS UK LTD, UK	
	M/s	COOPER CAMERON, SINGAPORE	
	M/s	CCI, USA	
	M/s	JVS ENGINEERS, INDIA	
	M/s	Master Flo Valve Inc. CANADA	
<b>27</b>	<b>SAMPLE BOMB-(ASME SECVIII DIV1)</b>		
	M/s	HARSH ENGINEERING, MUMBAI INDIA	
<b>28</b>	<b>LAUNCHER / RECEIVER - (ASME-B31.4/31.8) -(ASME SEC VIII DIV1)</b>		
	M/s	PIPELINE ENGINEERING, UK	
	M/s	TD WILLIAMSON, USA	
	M/s	L&T, INDIA	
	M/s	FAI OFFICINE DI CARVICO S.P.A.,(CS-NACE & CS-NON NACE), ITALY	
	M/s	VEEKAY VIKRAM FOR LAUNCHER / RECEIVER & HINGED CLOSURE OF CS (NON-NACE) FOR SIZES UP TO 22"X16", 600 CLASS WITH 2YEARS EXTENDED WARRANTY	
<b>29</b>	<b>GASKETS</b>		
	M/s	MADRAS INDUSTRIAL PRODUCT, INDIA	
	M/s	IGP, INDIA	
<b>30</b>	<b>FLANGES-SUPER DSS</b>		
	M/s	OFFICINE NICOLA GALPERTI FIGLIO S.P.A, ITALY	

**NOTE:** While all the vendors supplying C.S. NACE can also be considered for CS Non-NACE items, the list given above for CS Non-NACE is an additional list for vendors supplying only carbon steel Non-NACE items and require pre-qualification for supplying items in C.S. NACE.

# **INSTRUMENTATION**

<b>1</b>	<b>ELECTRONICS TRANSMITTERS (PRESSURE / DP/ TEMPERATURE TRANSMITTER)</b>	
	M/s	YOKOGAWA INDIA LIMITED
	M/s	BAILEY CONTROLS, USA.
	M/s	EMERSON PROCESS MANAGEMENT
	M/s	HONEYWELL AUTOMATION INDIA LTD
	M/s	ABB - INSTRUMENTATION LTD.
	M/s	ITT, BARTON
	M/s	INSTRUMENTATION LTD. KOTA
	M/s	SCHLUMBERGER
	M/s	FUJI
<b>2</b>	<b>PRESSURE SWITCHES, DIFFERENTIAL PRESSURE SWITCHES / TEMPERATURE SWITCHS</b>	
	M/s	DAG PROCESS INSTRUMENTS
	M/s	SOR, USA
	M/s	SWITZER INSTRUMENT LIMITED
	M/s	INDFOSS IND. LIMITED,
	M/s	UNITED ELECTRIC , USA / UK / JAPAN
	M/s	DRESSER INC, USA
	M/s	SIRCO CONTROLS LTD., UK
	M/s	VASU TECH. LTD.
	M/s	DELTA CONTROLS
	M/s	KDG INSTRUMENTS
	M/s	NAGANO-KEIKI
	M/s	ITT, SCHNEIDER
	M/s	ASCHCROFT
	M/s	ASCO
	M/s	BETA BV
	M/s	BOURDON HAENNI S.A
	M/s	GENERAL INSTRUMENTS CONSORTIUM
	M/s	PYRO PRESS ENGG CO LTD
	M/s	REGULATEURS GEORGIN S.A
	M/s	ROBERTSHAW CONTROLS CO
<b>3</b>	<b>PNEUMATIC PR. SWITCH/ HI-LO PILOTS (INDICATING DIAL TYPE)</b>	
	M/s	e-PRODUCTIONS SOLUTION
	M/s	WKM

	M/s	AXELSON
	M/s	PT-PETROTECH
	M/s	HALLIBURTON ENERGY
	M/s	RUELCO
<b>4</b>	<b>PRESSURE SWITCHES (EXPLOSION PROOF)</b>	
	M/s	SOR
	M/s	ITT NEODYN
	M/s	ASCHCROFT
	M/s	YOKOGAWA
	M/s	DELTA CONTROLS
	M/s	e-PRODUCTIONS SOLUTION
	M/s	DANFOSS
	M/s	YEW
	M/s	DAG PROCESS
<b>5</b>	<b>FLOW SWITCHES (PNEUMATIC &amp; ELECTRICAL)</b>	
	M/s	MSW
	M/s	MAGNETROL
	M/s	TOKYO KEISO
	M/s	YOKOGAWA INDIA LIMITED
	M/s	BARTON INSTRUMENT SYSTEM LIMITED
	M/s	LINK
<b>6</b>	<b>PRESSURE SAFETY VALVE / RELIEF VALVE</b>	
	M/s	ANDERSON GREEWOOD CROSBY.
	M/s	MEKASTER ENGINEERING PVT LTD.
	M/s	TYCO SANMAR ,TRICHY
	M/s	BHEL, TRICHY
	M/s	INSTRUMENTATION LTD., PALGHAT
	M/s	NAKAKITA SESAKUSHO CO. LTD, JAPAN
	M/s	NUOVO PIGNONE SPA, ITALY
	M/s	SAFETY INSTRUMENT SYSTEM LTD
	M/s	SAPAG - ALSTHOM
	M/s	FUKUI
	M/s	Bliss Anand (Manufacturer of Farris brand PRV, under license from M/s Farris Engineering, a Curtis Wright group of company)
	M/s	TRIANGLE
	M/s	L&T Valves Ltd. India
	M/s	HAM-LET ADVANCED CONTROL TECHNOLOGY
	M/s	MOORCO (ONLY FOR NON-ASME SERVICE)

	M/s	IMI BAILEY BIRKIT
	M/s	TELEDYNE FARRIS ENGINEERING
	M/s	DRESSER INC.
	M/s	LESER GMBH & CO. KG
	M/s	PARCOL SPA
	M/s	SEBIM VALVES INDIA PVT LTD
	M/s	TRILLIUM FLOW TECHNOLOGIES INDIA PRIVATE LIMITED, NEW DELHI
	M/s	KINGSLEY ENGINEERING SERVICES, ANKLESHWAR
	M/s	NU-TECH CONTROLS, AHMEDABAD
<b>7</b>	<b>PRESSURE GAUGES &amp; RECEIVER GAUGES</b>	
	M/s	MANOMETER (INDIA), BOMBAY
	M/s	H GURU INSTRUMENTS (SOUTH INDIA)PVT.LTD.
	M/s	GENERAL INSTRUMENTS CONSORTIUM.
	M/s	WIKA INSTRUMENTS INDIA PVT. LTD.
	M/s	A.N. INSTRUMENTS PVT. LTD.
	M/s	GLUCK (INDIA) MFG. CO.
	M/s	BAUMER TECHNOLOGIES INDIA PVT LTD. (Formerly WAREE INSTRUMENTS LTD.)
	M/s	BUDENBERG GAUGE CO. LTD.
	M/s	GAUGES BOURDEN
	M/s	BARTON INSTRUMENT SYSTEM LIMITED
	M/s	AMETEK
	M/s	BADOTHERM PROCESS INSTRUMENTS B.V
	M/s	BOURDON HAENNI S.A
	M/s	BRITISH ROTOTHERM CO. LTD
	M/s	DRESSER INC.
	M/s	FORBES MARSHALL PVT LTD,.
	M/s	NAGANO KEIKI SEISAKUSHO LTD
	M/s	PRECISION INDUSTRIES
	M/s	WALCHANDNAGAR INDUSTRIES LTD
	M/s	WIKA ALEXANDER WIEGAND & CO GMBH
<b>8</b>	<b>DIFFERENTIAL PRESSURE GAUGES /TRANSMITTERS</b>	
	M/s	ROSEMOUNT
	M/s	ENDRESS + HAUSER
	M/s	ANI INSTRUMENTS PVT. LTD.
	M/s	HIRLEKAR PRESSION ENGINEERING PVT. LTD.
	M/s	SAMSON CONTROLS PVT. LTD.
	M/s	SWITZER INSTRUMENT LTD.
	M/s	BAUMER TECHNOLOGIES INDIA PVT LTD. (Formerly WAREE INSTRUMENTS LTD.)



	M/s	WIKA INSTRUMENTS INDIA PVT. LTD.
	M/s	BUDENBERG GAUGE CO. LTD.
	M/s	BOURDON
	M/s	GAUGES BOURDON
	M/s	BARTON INSTRUMENT SYSTEM LIMITED
	M/s	MERIAM PROCESS TECHNOLOGIES
	M/s	ITT BARTON
	M/s	GENERAL INSTRUMENTS CONSORTIUM
	M/s	SWITZER INSTRUMENT LTD
<b>9</b>	<b>PNEUMATIC INDICATING CONTROLLER</b>	
	M/s	YOKOGAWA INDIA LTD.
	M/s	EMERSON PROCESS MANAGEMENT (EARLIER FISHER)
	M/s	BARTON INSTRUMENT SYSTEM LIMITED
	M/s	FOXBORO
	M/s	ABB - KENT
	M/s	ABB INDIA LIMITED, BENGALURU
	M/s	BRISTOL BABCOCK
	M/s	ITT BARTON
	M/s	MASONEILAN INDIA LTD.
	M/s	V AUTOMAT AND INSTRUMENTS PVT. LTD., NEW DELHI
<b>10</b>	<b>TEMPERATURE ELEMENTS &amp; THERMOWELLS</b>	
	M/s	GENERAL INSTRUMENTS, BOMBAY
	M/s	DETRIV INSTRUMENTATION, BOMBAY
	M/s	NAGMAN SENSORS PVT. LTD, MADRAS
	M/s	PYRO-ELECTRIC INSTRUMENT, GOA
	M/s	TEMP TECH.
	M/s	ALTOP INDUSTRIES.
	M/s	ABB AUTOMATION LTD
	M/s	BOURDON HAENNI S.A
	M/s	DAILY THERMETRICS
	M/s	GAYESCO LLC
	M/s	INVENSYS SOFTWARE SYSTEMS (S) PTE
	M/s	JAPAN THERMOWELL CO LTD
	M/s	TEMPSEN INSTRUMENT INDIA LTD
	M/s	THERMO ELECTRIC CO. INC.
	M/s	THERMO ELECTRIC PRODUCTS CO
	M/s	THERMO ELCTRA B.V
	M/s	T M TECNOMATIC SPA

	M/s	WIKA ALEXANDER WIEGAND & CO GMBH
<b>11</b>	<b>TEMPERATURE GAUGES</b>	
	M/s	MANOMETER (INDIA), BOMBAY
	M/s	GENERAL INSTRUMENTS INIDA
	M/s	H GURU INSTRUMENTS (SOUTH INDIA) PVT.LTD.
	M/s	GLUCK (INDIA) MFG.
	M/s	WIKA INSTRUMENTS INDIA PVT. LTD.
	M/s	ASCHCROFT
	M/s	NAGANO KEIKI
	M/s	GENERAL INSTRUMENTS CONSORTIUM, MUMBAI
	M/s	BAUMER TECHNOLOGIES INDIA PVT LTD. (Formerly WAREE INSTRUMENTS LTD.)
	M/s	GAUGES BOURDON
	M/s	A.N. INSTRUMENTS
	M/s	BADOTHERM PROCESS INSTRUMENTS B.V.
	M/s	DRESSER INC.
	M/s	PYRO-ELECTRIC INSTRUMENTS GOA PVT LTD
	M/s	SOLARTRON ISA
	M/s	WALCHANDNAGAR INDUSTRIES LTD
	M/s	WIKA ALEXANDER WEIGAND & CO GMBH
	M/s	BOURDON HAENNI S.A
<b>12</b>	<b>ORIFICE PLATES AND FLANGES AND RESTRICTION ORIFICE</b>	
	M/s	BALIGA LIGHTING EQUIPMENT, LTD.
	M/s	GURUNANAK ENGG. WORKS
	M/s	MICRO PRECISION PRODUCT PVT. LTD.
	M/s	MINCO (INDIA) PVT. LIMITED
	M/s	INSTRUMENTATION LTD., PALGHAT
	M/s	DANIEL MEASUREMENT & CONTROLS ASIA PACIFIC.
	M/s	FERRY EQUIPMENT CORPORATION. USA
	M/s	PETROL VALVES, ITALY
	M/s	ABB LIMITED
	M/s	MICRO PRECISION
	M/s	GENERAL INSTRUMENTS CONSORTIUM, MUMBAI
	M/s	EUREKA INDUSTRIAL EQUIPMENTS (P) LTD
	M/s	FMC MEASUREMENT SOLUTIONS-U.K
	M/s	JRU CONTROL PVT LTD
	M/s	PIETRO FORENTINI SPA
	M/s	STAR-MECH CONTROLS (INDIA) PVT LTD

	M/s	TM TECNOMATIC SPA	
<b>13</b>	<b>SINGLE/ DUAL CHAMBER ORIFICE FITTINGS</b>		
	M/s	DANIEL, USA	
	M/s	CAMERON MEASUREMENT SYSTEMS, UK	Through M/s CAMERON MIDDLE EAST FZE
	M/s	PERRY EQUIPMENT CORPORATION, USA	
	M/s	TMCO, USA	
	M/s	CANALTA CONTROLS LTD	
<b>14</b>	<b>ULTRASONIC FLOWMETER (LIQUID)</b>		
	M/s	CONTROLTRON, USA	
	M/s	FLOW TEC, UK	
	M/s	FUJI ELECTRIC, JAPAN	
	M/s	EMCO FLOW SYSTEM, U.S.A.	
	M/s	KROHNE MESSTECHNIK GMBH & CO. GERMANY	
	M/s	ENDRESS-HAUSER	
	M/s	EMERSON PROCESS AUTOMATION LTD.	
	M/s	PANAMETRICS	
	M/s	SICK-MAIHAK AG	
	M/s	CALDON LTD., USA	
	M/s	ELSTER-INSTROMET NV-FORMER	
	M/s	RMG REGEL + MESSTECHNIK GMBH	
	M/s	SIEMENS AG	
	M/s	THERMO ELECTRON CORPORATION	
	M/s	TOKYO KEISO CO LTD	
<b>15</b>	<b>ULTRASONIC FLOWMETER (GAS)</b>		
	M/s	CONTROLOTRON, USA	
	M/s	PANAMETRICS LTD, IRELAND	
	M/s	DANIEL MEASUREMENT SOLUTIONS PVT LTD.	
	M/s	SICK-MAIHAK AG	
	M/s	FMC MEASUREMENT SOLUTIONS. USA	
	M/s	INSTROMET INTERNATIONAL NV, BELGIUM	
	M/s	ENERGOFLOW AG, SWITZERLAND	
<b>16</b>	<b>VARIABLE AREA FLOWMETER (ROTAMETER)</b>		
	M/s	TRANSDUCER AND CONTROLS PVT. LTD	
	M/s	EUREKA INDUSTRIAL EQUIPMENT (P) LTD.	
	M/s	INSTRUMENTATION ENGINEERS PRIVATE LIMITED	
	M/s	KROHNE MARSHALL PRIVATE LIMITED	
	M/s	AFLOW GLASS EQUIPMENTS, INDIA	
	M/s	ROTA INSTRUMENTATION, INDIA	

	M/s	TOKYO KEISO CO. LTD.
	M/s	EMERSON PROCESS AUTOMATION
	M/s	INTRA AUTOMATION GMBH
	M/s	ABB AUTOMATION LTD
	M/s	ASA SPA
	M/s	HEINRICHS MESSTECHNIK GMBH
	M/s	KROHNE MESSTECHNIK GMBH & CO KG
	M/s	PLACKA INSTRUMENTS INDIA P LTD
<b>17</b>	<b>MASS FLOW METER/ CORIOLIS FLOWMETER AND NET OIL COMPUTERS</b>	
	M/s	EMERSON PROCESS MANAGEMENT INDIA LTD.
	M/s	FLUID COMPONENT, USA
	M/s	ENDRESS-HAUSER, GERMANY
	M/s	FMC MEASUREMENT SOLUTIONS. USA
	M/s	EMERSON PROCESS ASIA PACIFIC
	M/s	KROHNE MESSTECHNIK, GERMANY
	M/s	RHEONIK MESSGERATE GMBH, GERMANY.
	M/s	AGAR CORPORATION
	M/s	SCHLUMBERGER
	M/s	HEINRICHS GMBH
	M/s	BRONKHORST HIGH TECH BV
	M/s	FOX THERMAL INSTRUMENT INC.
	M/s	KURZ INSTRUMENTS INC
	M/s	MAGNETROL INTERNATIONAL N.V.
	M/s	TOKYO KEISO CO LTD
<b>18</b>	<b>WATER METERS</b>	
	M/s	ITT BARTON
	M/s	DASHMUK
	M/s	LAXONS, BOMBAY
	M/s	TOSHNIWAL BROS.
	M/s	CAPSTAN
	M/s	ROCKWIN
	M/s	MEINECKE
<b>19</b>	<b>TURBINE METER - LIQUID SERVICES</b>	
	M/s	ITT BURTON, U.S.A. / U.K.
	M/s	ROCKWIN FLOWMETER INDIA LTD.( FOR LIQUID SERVICE ONLY)
	M/s	DANIEL MEASUREMENT & CONTROLS ASIA PACIFIC.
	M/s	BROOKS INSTRUMENTS, U.S.A.( FOR LIQUID SERVICE ONLY)

	M/s	MOORCO, INDIA( FOR LIQUID SERVICE ONLY)
	M/s	BOPP AND REUTHER. GERMANY ( FOR LIQUID SERVICE ONLY)
	M/s	TYCO SANMAR( FOR LIQUID SERVICE ONLY)
	M/s	FMC SMITH METERS INC( FOR LIQUID SERVICE ONLY)
	M/s	ABB AUTOMATION LTD.
	M/s	BARTON INSTRUMENT SYSTEMS LTD.
	M/s	ELSTER-INSTROMET NV-FORMER 1563
	M/s	FMC MEASUREMENT SOLUTIONS
	M/s	FMC TECHNOLOGIES SANMAR LTD.
	M/s	HOFFER FLOW CONTROLS INC.
	M/s	FAURE HERMAN GROUP INTERTECHNIQUE
	M/s	SENSUS METERING SYSTEM INC, USA.(FOR GAS SERVICES ONLY)
	M/s	RMG REGEL+ MESSTECHNIC, GERMANY(FOR GAS SERVICES ONLY)
	M/s	THERMOELECTRON CORPORATION, USA(FOR GAS SERVICES ONLY)
<b>20</b>	<b>MAGNETIC FLOW METER</b>	
	M/s	YOKOGAWA, JAPAN
	M/s	YOKOGAWA INDIA LTD.
	M/s	ENDRESS-HAUSER
	M/s	KROHNE MARSHALL PRIVATE LIMITED
	M/s	EMERSON PROCESS MANAGEMENT (INDIA) PVT LTD
	M/s	ABB AUTOMATION LTD.
	M/s	HEINRICHS MESSTECHNIK GMBH.
	M/s	INSTRUMENTATION ENGINEERS PVT. LTD.
	M/s	INVENSYS SOFTWARE SYSTEMS (S) PTE. LTD.
	M/s	KROHNE MESSTECHNIK GMBH.& CO. KG.
	M/s	TOKYO KEISO CO. LTD.
	M/s	YAMATAKE CORPORATION LTD.
	M/s	ROCKWIN FLOWMETER INDIA PVT. LTD., GHAZIABAD
<b>21</b>	<b>VORTEX FLOW METER</b>	
	M/s	BOPP & REUTHER, GERMANY
	M/s	ABB AUTOMATION LTD., UK
	M/s	EMERSON PROCESS MGMT ASIA PACIFIC LTD.
	M/s	EMERSON PROCESS MGMT INDIA LTD.
	M/s	KROHNE MARSHALL PRIVATE LIMITED
	M/s	KROHNEMESSTECHNIK GMBH & CO KG, GERMANY
	M/s	OVAL CORPORATION, JAPAN

	M/s	RMG REGEL MESSTECHNIK GMBH, GERMANY
	M/s	YOKOGAWA ELECTRIC CORPORATION, JAPAN
	M/s	SIEBE INDIA (INVENSYS) LTD.
<b>22</b>	<b>AVERAGING PITOT TUBES</b>	
	M/s	STAR MECH CONTROLS(INDIA) PVT. LTD.
	M/s	EMERSON PROCESS MGT.
	M/s	MIDWEST INSTRUMENT, USA.
	M/s	THERMO BRANDT INSTRUMENTS, USA
	M/s	TORBAR FLOWMETERS LTD. UK.
	M/s	VERIS INC. USA.
	M/s	STAR-MECH CONTROLS INDIA PVT LTD.
	M/s	TM TECNOMATIC SPA.
<b>23</b>	<b>FLOW COMPUTER</b>	
	M/s	DANIEL
	M/s	ITT BARTON
	M/s	YOKOGAWA
	M/s	SOLARTRON TRANSDUCERS
	M/s	OMNI FLOW COMPUTERS INC.
	M/s	BRISTOL BABCOCK DIGITAL SYSTEM
	M/s	NUFLO
<b>24</b>	<b>FLOW TOTALIZER</b>	
	M/s	BARTON INSTRUMENT
	M/s	DANIEL MEASUREMENT & CONTROL
	M/s	YOKOGAWA
	M/s	CONTREC
<b>25</b>	<b>LEVEL GAUGES (REFLEX / TRANSPARENT)</b>	
	M/s	LEVCON INSTRUMENTS PVT. LIMITED
	M/s	TECHNOMATIC(INDIA) PVT LTD.
	M/s	PRATOLINA INSTRUMENTS PVT. LIMITED
	M/s	CHEMTROL ENGINEERING LIMITED
	M/s	BLISS ANAND PVT. LIMITED
	M/s	KROHNE MARSHALL PRIVATE LIMITED
	M/s	SIGMA INSTRUMENTS CO.
	M/s	V AUTOMAT AND INSTRUMENTS PVT. LTD., NEW DELHI
<b>26</b>	<b>GAUGE GLASS &amp; COCKS</b>	
	M/s	NIHON KLINGER
	M/s	PATROLE SERVICES
	M/s	JERGUSON GAUGE & VALVE COMPANY

	M/s	PENBURTY
	M/s	TECHNOMATIC
	M/s	CHEMTROLS INDUSTRIES LTD.
	M/s	PROTOLINA, MUMBAI
	M/s	SAMIL
	M/s	DANIELS,
	M/s	LEVCON INSTRUMENT PVT LTD
	M/s	ASIAN INDUSTRIAL VALVES & INSTRUMENTS
	M/s	BLISS ANAND PVT. LTD.
	M/s	KLINGER FLUID CONTROL GMBH.
	M/s	PHOENIX SYSTEMLEMENTE UND. MESSTECHNIK
	M/s	PUNE TECHTROL PVT. LTD.
	M/s	R. K. DUTT CONCERNS
	M/s	SIGMA INSTRUMENTS CO.
<b>27</b>	<b>LEVEL TRANSMITTER (DISPLACER TYPE - LEVELTROL)</b>	
	M/s	CHEMTROL INDUSTRIES LTD.
	M/s	MIL CONTROL LIMITED.
	M/s	FISHER XOMOX LTD.
	M/s	MAGNETROL INDIA PVT. LTD.
	M/s	DRESSER VALVE INDIA PVT. LTD.
	M/s	MSW CONTROLS,
	M/s	EMERSON PROCESS MANAGEMENT (EARLIER FISHER)
	M/s	DRESSER VALVE (INDIA) PVT.LTD. (FOR DISPOSAL LEVEL TRANSMITTERS)
	M/s	DRESSER MASONEILAN
	M/s	ECKARDT
	M/s	DRESSER PRODUITS INDUSTRIELS
	M/s	PARCOL SPA
	M/s	TOKYO KEISO CO LTD
	M/s	V AUTOMAT & INSTRUMENTS PVT LTD
	M/s	YAMATAKE CORPORATION PVT LTD
<b>28</b>	<b>LEVEL SWITCHES (DISPLACER TYPE)</b>	
	M/s	S.O.R.
	M/s	E-PRODUCTIONS SOLUTION
	M/s	BACKER-CAC
	M/s	LEVCON INSTRUMENTS, PVT. LTD. CALCUTTA
	M/s	PLACKA INSTRUMENTS, CONTROL PVT. LTD., CHENNAI
	M/s	DAG PROCESS INSTRUMENTS, MUMBAI

	M/s	BLISS ANAND PVT. LTD.
	M/s	SB ELECTRO MECHANICAL, PUNE
	M/s	ENDRESS-HAUSER
	M/s	CHEMTROL INDUSTRIES LTD.
	M/s	TRANSDUCERS & CONTROLS PVT. LTD.
	M/s	PATROL SERVICE
	M/s	MSW CONTROLS
	M/s	TOKYO KEISO
	M/s	MAGNETROL
	M/s	DAG PROCESS INSTRUMENTS, MUMBAI
	M/s	EMERSON PROCESS MGMT ASIA PACIFIC PTE LTD
	M/s	JRU CONTROLS PVT LTD.
	M/s	KROHNE MESSTECHNIK GMBH & CO. KG
	M/s	KSR KUEBLER NIVEAUMESS-TECHNIK AG
	M/s	MOBREY LTD.
	M/s	SIGMA INSTRUMENTS CO.
	M/s	V AUTOMAT & INSTRUMENTS PVT LTD.
<b>29</b>	<b>LEVEL SWITCHES (CAPACITANCE TYPE)</b>	
	M/s	ENDRESS-HAUSER
	M/s	SIEMENS
	M/s	AMTrex DEXEL BROOK, USA
	M/s	VEGA GRIESHABER K, GERMANY
	M/s	TRANSDUCERS & CONTROL PVT. LIMITED
	M/s	VENTURE MEASUREMENT COMPANY, USA
<b>30</b>	<b>TANK LEVEL INDICATORS (MECHANICAL FLOAT &amp; TAPE)</b>	
	M/s	SB ELECTROMECHANICALS
	M/s	NIVO CONTROLS PVT. LIMITED
	M/s	SIGMA INSTRUMENT CO.
	M/s	ENDRESS HAUSER
	M/s	TOKYO KEISO CO. LTD. JAPAN
	M/s	ENRAF, SINGAPORE
<b>31</b>	<b>TANK LEVEL INDICATORS (SERVO TYPE TGM / RADAR TYPE)</b>	
	M/s	ENRAF SINGAPORE PTE LTD., SINGAPORE
	M/s	EMERSON PROCESS CONTROLS
	M/s	SAAB ROSEMOUNT
	M/s	SBEM PVT LTD.
	M/s	TOKYO KEISO CO. LTD. JAPAN
	M/s	ENDRESS-HAUSER



<b>32</b>	<b>LEVEL INSTRUMENTS (RADAR TYPE/ULTRASONIC)</b>	
	M/s	ENRAF SINGAPORE PTE LTD., SINGAPORE
	M/s	SAAB ROSEMOUNT.
	M/s	ENDRESS-HAUSER.
	M/s	VEGA GRIESHABER K, GERMANY.
	M/s	KROHNE MESSTECHNIK, GERMANY
	M/s	EMERSON PROCESS CONTROLS.
	M/s	MAGNETROL
	M/s	SOLARTRON MOBREY LTD. UK (ULTRASONIC ONLY)
	M/s	AMTEK DREXELBROOK. USA
	M/s	SIEMENS MILLTRONICS PROCESS INST. INC. CANADA (ULTRASONIC ONLY)
	M/s	HAWK MEASUREMENT SYSTEMS PVT LTD.
	M/s	L&J TECHNOLOGIES
	M/s	MOBREY LTD
	M/s	SIEMENS AG
<b>33</b>	<b>CONTROL PANEL</b>	
	M/s	POSITRONIC, BARODA
	M/s	ELECTRO CONTROL SYSTEM NOIDA
	M/s	INDUSTRIAL CONTROL & APPLIANCES.
	M/s	RADHAKRISHNA CONTROLS, CALCUTTA
	M/s	PRIMA AUTOMATION INDIA PVT. LTD
	M/s	ACCUSONIC CONTROLS PVT. LTD.
	M/s	ELECTRONIC CORPORATION OF INDIA LTD.
	M/s	ELECTRONIC INSTRUMENTATION AND CONTROL
	M/s	INSTRUMENTATION LTD.
	M/s	KERALA STATE ELECT. DEV CORP. LTD.
	M/s	PYROTECH ELECTRONICS PVT. LTD.
	M/s	UDKAM PROCESS EQUIPMENT INDIA PVT LTD, GREATER NOIDA
<b>34</b>	<b>ELECTRONIC CONTROLLER (CONTROL PANEL INSTRUMENT)</b>	
	M/s	YOKOGAWA INDIA LTD.
	M/s	ABB INSTRUMENTATION LTD.
	M/s	TATA HONEYWELL
	M/s	BAILEY
	M/s	THERMAX
<b>35</b>	<b>PUSH BUTTONS / SWITCHES / LAMPS (CONTROL PANEL INSTRUMENT)</b>	
	M/s	TEKNIC CONTROLS

	M/s	KAYCEE
	M/s	L&T
	M/s	SIEMENS
<b>36</b>	<b>ALARM ANNUNCIATORS (CONTROL PANEL INSTRUMENT)</b>	
	M/s	DIGICONT
	M/s	ECIL
	M/s	PROCON INSTRUMENTATION PVT. LTD
	M/s	ICA
	M/s	INDUSTRIAL INSTRUMENT CONTROLS.
	M/s	INSTALARM INSTRUMENTS PVT. LTD.
	M/s	RONAN ENGINEERING COMPANY,UK.
	M/s	IDEC IZUMI CORPORATION JAPAN
	M/s	ROCHESTER INSTRUMENT SYSTEM, UK.
	M/s	INSTRUMENTATION LTD.
	M/s	MINILEC INDIA PVT LTD.
<b>37</b>	<b>RECEIVER INSTRUMENTS (CONTROL PANEL INSTRUMENT) - (INDICATORS / RECORDERS / SIGNAL DISTRIBUTORS / ALARM CARDS)</b>	
	M/s	ABB INSTRUMENTATION LTD.
	M/s	TATA HONEYWELL
	M/s	YOKOGAWA INDIA LTD.
	M/s	ITT BARTON. UK
<b>38</b>	<b>INTRINSIC SAFETY BARRIERS &amp; RECEIVER SWITCHES</b>	
	M/s	MTL
	M/s	R. STAHL
	M/s	PEPPERL + FUCHS
	M/s	HANS TRUCK GMBH & CO. KG
<b>39</b>	<b>GAS &amp; FIRE DETECTION SYSTEM / PORTABLE GAS DETECTOR</b>	
	M/s	GENERAL MONITORS. UK
	M/s	DETECTION INSTRUMENTS (CROWCON),UK.
	M/s	DETECTOR ELECTRONICS CORPORATION.
	M/s	DRAGER SAFETY AG & CO. (GERMANY)
	M/s	OLDHAM (FRANCE)
	M/s	JOSEPH LESLIE DRAEGGER
	M/s	SAMRAD OPTRONICS ICARE (FRANCE)
	M/s	GASTECH INC (USA)
	M/s	INTERNATIONAL SENSOR TECHNOLOGY (USA)
	M/s	OLIVER IGD LTD. UK
	M/s	SEIGER, U.K.

	M/s	HONEYWELL AUTOMATION INDIA LTD (HAIL)	
	M/s	YOKOGAWA INDUSTRIAL SAFETY SYSTEM	
	M/s	HAVEN AUTOMATION	
	M/s	DELPHIAN	
	M/s	NOHMI BOSAI	
	M/s	G.P. ELLIOT	
	M/s	SAFETY SYSTEMS	
	M/s	ICS	
	M/s	MSA (INDIA) LTD.	
	M/s	CHEMTROLS ENGINEERING LTD.	
	M/s	HONEYWELL ANALYTICS	
	M/s	MINE SAFETY APPLIANCES COMPANY	
	M/s	RIKEN KEIKI CO LTD.	
	M/s	Detcon Inc., USA	
	M/s	Scame Sistemi S.R.L, Italy	
	M/s	JSC-ELECTRONSTANDART-PRIBOR, RUSSIA	(Through M/s ESP SAFETY PVT. LTD.)
<b>40</b>	<b>SMOKE/ THERMAL DETECTORS</b>		
	M/s	APOLLO	
	M/s	THORN	
	M/s	ZELLWEGE	
<b>41</b>	<b>MANUAL CALL POINT (FOR FIRESTATION)</b>		
	M/s	APPOLO	
	M/s	VIJAY FIRE	
	M/s	SIMPLEX	
	M/s	NEW FIRE	
	M/s	MEDC	
	M/s	SAFETY SYSTEMS	
<b>42</b>	<b>I/P CONVERTERS</b>		
	M/s	MTL INSTRUMENTS PVT LTD.	
	M/s	ABB AUTOMATION LTD.	
	M/s	YOKOGAWA INDIA LIMITED	
	M/s	GOULD ,USA	
	M/s	HARTMAN & BRAUN	
	M/s	MASONEILAN	
	M/s	MOORE CONTROLS (P) LTD	
	M/s	BAILEY CONTROLS	
	M/s	EMERSON PROCESS CONTROLS.	

	M/s	IMI WATSON SMITH LTD
	M/s	SHREYAS INSTRUMENTS PVT. LTD.
	M/s	THERMO BRANDT INSTRUMENTS
<b>43</b>	<b>AIR FILTER REGULATORS</b>	
	M/s	SHAVO NORGREN (I) PVT LTD., BOMBAY
	M/s	PLACKA INSTRUMENTS (P) & CONTROLS, MADRAS
	M/s	ABB INSTRUMENTATION LTD.
	M/s	MASONEILAN, INDIA
	M/s	FISHER XOMOX
	M/s	DRESSER VALVE INDIA PVT. LTD.
	M/s	BIFOLD FLUID POWER LIMITED
	M/s	EMERSON PROCESS MANAGEMENT
	M/s	DIVYA CONTROL ELEMENTS PVT. LTD.
	M/s	JANATICS INDIA PVT. LTD.
	M/s	SCHRADER DUNCAN LTD.
	M/s	SHAH PNEUMATICS
	M/s	V AUTOMAT & INSTRUMENTS PVT LTD.
	M/s	VELJAN HYDRAIR PVT LTD.
<b>44</b>	<b>SOLENOID VALVES</b>	
	M/s	AVCON CONTROLS PVT LTD, BOMBAY
	M/s	ROTEX MFRS. & ENGRS. PVT. LTD., BOMBAY
	M/s	ASCO
	M/s	MAXSEAL USA.
	M/s	SKINNER USA.
	M/s	VERSA BV, NETHERLAND
	M/s	BLACKBOROUGH
	M/s	HERION WERKE
	M/s	BIFOLD FLUID POWER LIMITED
	M/s	ALCON ALEXANDER CONTROLS LIMITED
	M/s	PRECISION INSTRUMENTS COMPANY
	M/s	ROTEX AUTOMATION LTD
	M/s	SCHRADER DUNCAN LTD.
<b>45</b>	<b>CONTROL VALVES- BODY TYPE GLOBE AND ANGLE/BUTTERFLY BODY</b>	
	M/s	SAMSON CONTROLS PVT. LTD.
	M/s	HTC LTD.
	M/s	FISHER XOMOX LTD.
	M/s	INSTRUMENTATION LIMITED, PALGHAT
	M/s	CONTINENTAL VALVE LTD.
	M/s	MIL CONTROL LTD.

	M/s	NEILS JAMESBURY (BODY TYPE GLOBE AND ANGLE)
	M/s	DRESSER VALVE INDIA PVT. LTD.
	M/s	KOSO INDIA PRIVATE LTD.
	M/s	MOTOYAMA ENGG. WORKS LTD. JAPAN
	M/s	ABB INSTRUMENTATION LTD. (BODY TYPE GLOBE AND ANGLE)
	M/s	WEIR VALVES & CONTROLS LTD.
	M/s	BLAKE BOROUGH (BODY TYPE GLOBE AND ANGLE)
	M/s	KOSO FLUID CONTROLS PVT LTD
	M/s	METSO AUTOMATION PTE LTD.
	M/s	SPX VALVES AND CONTROLS, USA.
	M/s	ARCA REGLER GMBH
	M/s	DRESSER PRODUITS INDUSTRIELS
	M/s	FORBES MARSHALL ARCA P LTD
	M/s	ITALVALV S.N.C
	M/s	KENT INTROL PVT LTD
	M/s	KENT INTROL U.K LTD
	M/s	NUOVO PIGNONE SPA
	M/s	SEVERN GLOCON LTD, UK
	M/s	SEVERN GLOCON INDIA PVT. LTD., CHENNAI, INDIA
<b>45 A</b>	<b>MOTOR OPERATED VALVES</b>	
	M/s	MICROFINISH VALVES PVT. LTD
	M/s	ROTORK CONTROLS INDIA LTD (ACTUATOR)
	M/s	LIMITORQUE INDIA LTD (ACTUATOR)
	M/s	AUMA INDIA PRIVATE LTD
<b>46</b>	<b>ON-OFF VALVES (BALL VALVES)</b>	
	M/s	MICROFINISH VALVES PVT. LTD.
	M/s	VIRGO ENGINEERS PVT. LTD.
	M/s	ELOMATIC PVT. LTD.
	M/s	NUOVO PIGNONE SPA.
	M/s	WEIR VALVES AND CONTROLS, UK
	M/s	TYCO VALVES AND CONTROLS INDIA PVT. LTD.
	M/s	KITAMURA VALVE MFG. CO. LTD. JAPAN
	M/s	METSO AUTOMATION PTE LTD. USA
	M/s	DRESSER ITALIA, ITALY
	M/s	L&T Valves Ltd. India
	M/s	GROVE, ITALIA
	M/s	NEILS JAMESBURY
	M/s	HINDLE COCKBURNS LTD (TYCO GROUPS)
	M/s	COOPER CAMERON VALVE ITALY
	M/s	ITALVALV S.N.C
	M/s	KOSO FLUID CONTROLS PVT LTD
	M/s	PIBIVIESSE S.P.A

	M/s	ROTEX MANUFACTURING & ENGINEERING Pvt Ltd, DOMBIVILI-421204, MAHARASTRA
<b>47</b>	<b>ON-OFF VALVES (BUTTERFLY BODY)</b>	
	M/s	TYCO VALVES & CONTROLS INDIA PVT. LTD.
	M/s	INSTRUMENTATION LTD., PALGHAT
	M/s	NUOVO PIGNONE SPA
	M/s	ELOMATIC PVT LTD.
	M/s	CONTINENTAL VALVE LTD.
	M/s	MOTOYAMA ENGG, WORKS LTD. JAPAN
	M/s	METSO AUTOMATION PTE LTD.
	M/s	ITALVALV S.N.C
	M/s	KOSO FLUID CONTROLS PVT LTD
	M/s	COOPER CAMERON VALVE ITALY
<b>48</b>	<b>ON-OFF VALVES (PLUG)</b>	
	M/s	SPX VALVES AND CONTROLS
	M/s	DRESSER ITALIA
	M/s	FLOSERVE PTE, LTD.
	M/s	COOPER CAMERON VALVE ITALY
<b>49</b>	<b>ON-OFF VALVES (GATE)</b>	
	M/s	SPX VALVES AND CONTROLS
	M/s	COOPER CAMERON SINGAPORE PTE LTD.
	M/s	WEIR VALVES AND CONTROLS
	M/s	KOSO FLUID CONTROLS PVT LTD
	M/s	COOPER CAMERON VALVE ITALY
<b>50</b>	<b>SELF ACTUATED PRESSURE CONTROL VALVES</b>	
	M/s	FISHER CONTROLS / FISHER SANMAR
	M/s	DRESSER MASONEILAN
	M/s	ESME
	M/s	WEIR VALVES & CONTROLS LTD. (HOPKINSONS LTD)
	M/s	ELECTRICAL STEAM & MINING EQUIPMENT LTD,
	M/s	DRESSER VALVE INDIA PVT. LTD.
	M/s	JORDAN VALVE
	M/s	DANIEL MEASUREMENT & CONTROL ASIA PACIFIC
	M/s	ELSTER-INSTRUMET NV-FORMAR 1563
	M/s	EMERSON PROCESS MGMT. ASIA PACIFIC PTE. LTD.
	M/s	GORTER CONTROLS B.V.
	M/s	KAYE & MACDONALD INC.
	M/s	NIRMAL INDUSTRIAL CONTROL PVT LTD

	M/s	NUOVO PIGNONE SPA
	M/s	PIETRO FIORENTINI SPA
	M/s	RICHARDS INDUSTRIES
	M/s	RMG REGEL + MESSTECHNIK GMBH
	M/s	SAMSON AG MESS-UND REGELTECHNIK
<b>51</b>	<b>HIGH PRESSURE CONTROL VALVES (HCV)</b>	
	M/s	DRESSER MASONEILAN
	M/s	MOKVELD
	M/s	FISHER CONTROLS (NOW EMERSON)
	M/s	KENT PROCESS CONTROL LTD
	M/s	CONTROL COMPONENT INC.
	M/s	WEIR VALVES & CONTROLS UK LTD.
	M/s	KOSON PROCESS CONTROLS
<b>52</b>	<b>ACTUATOR (FOR SHUTDOWN VALVES)</b>	
	M/s	BETTIS
	M/s	ROTORK
	M/s	BIFFI
	M/s	EL-O-MATIC
	M/s	ROTEX MANUFACTURING & ENGINEERING Pvt Ltd, DOMBIVILI-421204, MAHARASTRA
<b>53</b>	<b>LIMIT SWITCHES</b>	
	M/s	BETTIS
	M/s	HONEYWELL AUTOMATION INDIA LTD. (HAIL)
<b>54</b>	<b>DELUGE VALVE WITH TEST FACILITY</b>	
	M/s	GEORGE KENT
	M/s	WORMALD
	M/s	CLA-VAL
	M/s	HD FIRE PROTECT PVT. LTD.
	M/s	DE's TECHNICO LTD., KOLKATA
<b>55</b>	<b>JUNCTION BOXES &amp; CABLE GLANDS</b>	
	M/s	FLEXPRO ELEC., PVT. LIMITED
	M/s	BALIGA LIGHTING EQUIPMENT LTD.
	M/s	EX PROTECTA
	M/s	FLAMEPROOF CONTROL GEARS, BOMBAY
	M/s	CEAG FLAMEPROOF CONTROL GEARS PVT. LIMITED
<b>56</b>	<b>INSTRUMENTATION CABLES (ALARM, SIGNAL, CONTROL &amp; THERMO COUPLE EXTN. CABLES)</b>	
	M/s	POLY CABLE WIRES PVT. LTD

	M/s	SUYOG ELECTRICALS LTD.
	M/s	ASSOCIATED CABLES PVT. LIMITED
	M/s	ASSOCIATED FLEXIBLES & WIRES (P) LTD.
	M/s	UNIVERSAL CABLES LTD.
	M/s	RELIANCE ENGINEERS LTD.
	M/s	BROOKS CABLES WORKS, MUMBAI
	M/s	DELTON CABLES LTD
	M/s	INCAB INDUSTRIES LTD.
	M/s	NICCO CORPORATION LTD.
	M/s	ASIAN CABLES
	M/s	CMI LIMITED
	M/s	CORDS CABLE INDUSTRIES LTD
	M/s	ELKAY TELELINKS LTD.
	M/s	FINE CORE CABLE PVT LTD.
	M/s	PARAMOUNT COMMUNICATIONS LTD.
	M/s	RADIANT CABLE PVT LTD.
	M/s	THERMO CABLES LTD.
	M/s	KEI INDUSTRIES LTD.
	M/s	GOYOLENE FIBRES INDIA PVT. LTD.
<b>57</b>	<b>COMMUNICATION CABLES</b>	
	M/s	ASSOCIATED CABLES (P) LIMITED
	M/s	ASSOCIATED FLEXIBLE AND WIRES (P) LIMITED
	M/s	UNIVERSAL CABLES
	M/s	UDAY PYRO CABLE PVT. LIMITED
	M/s	BROOKS CABLE WORKS
	M/s	INCAB INDUSTRIES LIMITED
	M/s	TORRENT CABLES
	M/s	PROCON, PUNE
	M/s	KEI INDUSTRIES LTD.,MUMBAI
	M/s	JINRO INDUSTRIES,
	M/s	NEXANS-S.A
	M/s	CORDS CABLE INDUSTRIES LTD
	M/s	DELTON CABLES LTD (SUPPLY FROM DHARUHERA WORKS)
	M/s	ELKAY TELELINKS LTD, Faridabad
	M/s	BIRLA ERICSSON OPTICAL LTD (Jelly Filled) ENQUIRY TO M/S VINDHYA TELELINK LTD (V029), ONLY ONE OFFER EITHER FROM M/S BIRLA ERICSSON (B155), OR M/S VINDHYA TELELINK LTD (092), SAME GROUP COMPANY, IS ACCEPTABLE



	M/s	CMI LTD
	M/s	FINOLEX CABLES LTD (Jelly Filled) - PIMRI WORKS, PUNE
	M/s	KEC INTERNATIONAL LTD (FORM. R133) (Jelly Filled)
	M/s	VINDHYA TELELINKS LTD (Jelly Filled) - ENQUIRY TO M/S VINDHYA TELELING LTD, ONLY ONE OFFER EITHER FROM M/S BIRLA ERICSSON (N155), OR M/S VINDHYA TELELING LTD (V092), SAME GROUP COMPANY , IS ACCEPTABLE
<b>58</b>	<b>OPTICAL FIBRE CABLE</b>	
	M/s	BIRLA ERICSSON OPTICAL LTD.
	M/s	STERLITE TECHNOLOGIES LTD.
	M/s	APAR INDUSTRIES LTD., VADODARA
	M/s	HIMACHAL FUTURISTIC COMMUNICATION LTD.
	M/s	UM CABLES LTD.
	M/s	VIDYA TELELINKS LTD.
<b>59</b>	<b>FRP CABLE TRAYS</b>	
	M/s	SUPER REINFORCED PLASTICS ASSOCIATED ENGG. CORP, MUMBAI
	M/s	GRIP INDIA, MUMBAI
	M/s	SSB INDUSTRIES, BANGALORE
	M/s	ERCON COMPOSITES, JODHPUR.
<b>60A</b>	<b>INSTRUMENT FITTINGS (SS - TUBE FITTING)</b>	
	M/s	SWAGELOK INDIA
	M/s	PARKER, INDIA
	M/s	ASTEC, MUMBAI
	M/s	DK TECH CORPORATION
	M/s	HAM-LET ADVANCED CONTROL TECHNOLOGY
	M/s	PRECISION ENGINEERING INDUSTRIES, MUMBAI
	M/s	FLUID CONTROL PVT. LTD., MUMBAI
	M/s	HY-LOK CORPORATION
	M/s	HAVI ENGINEERING INDIA PVT. LTD., THANE (Only for SS Tube fittings)
	M/s	PANAM ENGINEERS LIMITED
<b>60B</b>	<b>INSTRUMENTATION TUBING (SS - TUBE)</b>	
	M/s	RATNAMANI METALS AND TUBE LTD., AHMEDABAD
	M/s	SANDVIK ASIA PVT. LTD., PUNE (ADOPTED FROM OFFSHORE SVL)
<b>61</b>	<b>FUSIBLE PLUGS</b>	
	M/s	e-PRODUCTIONS SOLUTION
	M/s	SIGMA
	M/s	RUELCO

<b>62</b>	<b>ERECTION HARDWARE</b>	
	M/s	HYDAIR ENGG WORKS, BOMBAY
	M/s	RELIANCE ENGG & ELECT CORPN, NEW DELHI
	M/s	EXCELSIOR ENGG WORKS, BOMBAY
	M/s	TECHNOMATIC CONTROLS PVT. LIMITED
	M/s	MULTIMETAL INDUSTRIES, BARODA
	M/s	EX-PROTECTA
	M/s	FLEXPRO
	M/s	FLAME PROOF CONTROL GEARS, MUMBAI
<b>63</b>	<b>REMOTE IGNITOR</b>	
	M/s	AIROIL- FLAREGAS (INDIA) LIMITED
	M/s	V.AUTOMAT & INSTRUMENTS PVT LIMITED, INDIA.
	M/s	COMBUSTION CONTROL ENGINEERS, INDIA
	M/s	SAMIA, ITALY.
<b>64</b>	<b>FLAME ARRESTORS</b>	
	M/s	PETROL SERVICE
	M/s	GROTH EQUIPMENT CORPORATION
	M/s	GPE CONTROLS
	M/s	BRAUNSCH WEIGR FLAMMENFILTER, GMBH, WG
	M/s	WHERSOC, S.A.
	M/s	SHAND & JURS
	M/s	MARVAC
	M/s	SAFETY SYSTEM
	M/s	PROTEGO INDIA PRIVATE LIMITED, MUMBAI
	M/s	KINGSLEY ENGINEERING SERVICES, ANKLESHWAR
<b>64 A</b>	<b>FLAME DETECTORS</b>	
	M/s	MSA SAFETY SYSTEM
	M/s	HONEYWELL
<b>65</b>	<b>PH METER</b>	
	M/s	YOKOGAWA ELECTRICAL COPORATION
	M/s	I.T.T. BARTON
	M/s	EMERSON PROCESS MANAGEMENT INDIA PVT.
	M/s	PIECO ELECTRONICS & ELECTRICALS LTD.
	M/s	SOLARTRON TRANSDUCERS
	M/s	ZELEWEGER SA
<b>66</b>	<b>DEW POINT MONITOR</b>	
	M/s	PANAMETRICS
	M/s	SHAW, U.K.
	M/s	D U PONT.
	M/s	SOLARTRON TRANSDUCERS.
	M/s	LLC SPA VYMPEL, MOSCOW, RUSSIAN FEDERATION

<b>67</b>	<b>B&amp;SW MONITOR/ WATER CUT METER</b>	
	M/s	EMERSON PROCESS MANAGEMENT
	M/s	EESIFLO INTERNATIONAL PTE LTD., SINGAPORE
	M/s	HYDRYL
	M/s	SOLARTRON TRANSDUCERS
	M/s	SENTECH
<b>68</b>	<b>CONDUCTIVITY ANALYSER</b>	
	M/s	ABB AUTOMATION LTD
	M/s	EMERSON PROCESS MANAGEMENT ASIA PACIFIC PTE INDIA
	M/s	FORBES MARSHALL PRIVATE LIMITED, PUNE
	M/s	INVENSYS INDIA PRIVATE LIMITED
	M/s	HONEYWELL INC.
<b>69</b>	<b>WATER QUALITY ANALYSER</b>	
	M/s	ABB AUTOMATION LTD
	M/s	EMERSON PROCESS MANAGEMENT ASIA PACIFIC PTE INDIA
	M/s	FORBES MARSHALL PRIVATE LIMITED, PUNE
	M/s	BRISTOL BABCOCK, AUSTRALIA
	M/s	SERES, FRANCE
	M/s	TELEDYNE TEKMAR, USE
	M/s	IONIC, USA
	M/s	THERMONIX LTD. UK
	M/s	ZELEWEGER SA, FRANCE
<b>70</b>	<b>OXYGEN ANALYSER</b>	
	M/s	ABB AUTOMATION LTD
	M/s	EMERSON PROCESS MANAGEMENT ASIA PACIFIC PTE INDIA
	M/s	ZELEWEGER SA, FRANCE
	M/s	AMETEX, USA
	M/s	EMP COMPANY INC. USA,
	M/s	PANAMETRICS LTD, IRELAND
	M/s	SECO CONTROLS PVT. LTD.
	M/s	SYSTECH INSTRUMENTS, UK
	M/s	ORBI SPHERE (HACH ULTRA ANALYTICS)
<b>71</b>	<b>CHLORINE ANALYZER</b>	
	M/s	EMERSON PROCESS MANAGEMENT
<b>72</b>	<b>PROCESS GAS ANALYSER</b>	
	M/s	ABB AUTOMATION LTD
	M/s	PANAMETRICS LTD, IRELAND
	M/s	SERVOMAX PLC, TAIWAN

	M/s	SICK MAIHAK, GERMANY
	M/s	MSA (INDIA) LTD.
	M/s	SpectraSensors Inc., USA
	M/s	JP3 MEASUREMENT, LLC, USA
<b>73</b>	<b>SPECIFIC GRAVITY ANALYZER</b>	
	M/s	BOPP & REUTHER MESSTECHNIK GMBH, GERMANY
	M/s	EMERSON PROCESS MANAGEMENT
	M/s	THERMO MEASUREMENT, UK
	M/s	EMERSON PROCESS, SINGAPORE
	M/s	ENDRESS-HAUSER, GERMANY
	M/s	YOKOGAWA INDIA LIMITED
	M/s	CHEMTROL ENGINEERING WORKS
<b>74</b>	<b>VISCOSITY ANALYSER</b>	
	M/s	SOLARTON MOBREY LTD., UK
	M/s	SERES, FRANCE
	M/s	ENDRESS-HAUSER, GERMANY
	M/s	PEEK MEASUREMENT, UK / USA
<b>75</b>	<b>HYDROGEN ANALYSER</b>	
	M/s	SIEMENS APPLIED AUTOMATION, USA
	M/s	AMETEK, USA
	M/s	FLUID DATA (NOW NAMED THERMO ONIZ LTD.), UK
	M/s	EMERSON PROCESS MANAGEMENT
	M/s	MINE SAFETY APPLIANCES, USA
	M/s	PANAMETRIC LTD., IRELAND
<b>76</b>	<b>MOISTURE ANALYZER SYSTEM INTEGRATOR</b>	
	M/s	CHEMTROL INDUSTRIES LTD. (WITH AMTEK MAKE MOISTURE ANALYZER)
<b>77</b>	<b>MACHINE MONITORING SYSEM</b>	
	M/s	BENTLY-NEVADA
	M/s	ENTEK IRD INTERNATIONAL (INDIA) LTD., USA
	M/s	SKF CONDITION MONITORING INCL, USA
	M/s	SHINKAWA ELECTRIC COMPANY LIMITED, JAPAN
	M/s	ROCKWELL AUTOMATION INDIA PVT LTD
	M/s	SENSONICS LIMITED, UK
<b>78</b>	<b>CCTV</b>	
	M/s	PHILIPS
	M/s	ECIL
	M/s	NELCO LTD
	M/s	AMERICAN DYNAMICS

	M/s	PELCO
	M/s	HONEYWELL
	M/s	VICON
	M/s	BOSCH
	M/s	HERNIS
<b>79</b>	<b>TELEMETRY INTERFACE CABINET</b>	
	M/s	MARINE ELECTRICALS, MUMBAI
	M/s	FABRICON, MUMBAI
	M/s	SWITCH GEARS & CONTROL, MUMBAI
	M/s	MARINE DELIGHT, CALCUTTA
	M/s	YOKOGAWA INDIA LIMITED
	M/s	e-PRODUCTION SOLUTION
	M/s	ELEC. MECH. CORPORATION, MUMBAI
<b>80</b>	<b>DISTRIBUTED CONTROL SYSTEM</b>	
	M/s	FOXBORO (INVENSYS)
	M/s	BAILEY CONTROLS
	M/s	TOSHIBA
	M/s	HONEYWELL AUTOMATION INDIA LTD (HAIL)
	M/s	YOKOGAWA INDIA LIMITED
	M/s	EMERSON PROCESS MANAGEMENT
	M/s	ABB INDIA LIMITED, BENGALURU
<b>81</b>	<b>PROGRAMMABLE LOGIC CONTROLLER (PLC SUBSYSTEM)</b>	
	M/s	YOKOGAWA INDIA LTD.
	M/s	ALLEN BRADLEY
	M/s	GE Intelligent Platforms Pvt Ltd.
	M/s	SIEMENS
	M/s	CEGELEC
	M/s	TATA-HONEYWELL
	M/s	BAILEY CONTROL USA
	M/s	ROCKWELL AUTOMATION
	M/s	ALSTOM PROJECTS INDIA
	M/s	HONEYWELL AUTOMATION INDIA LTD
	M/s	ABB INDIA LIMITED, BENGALURU
	M/s	HIMA PAUL HIDEBRANDT GMBH
	M/s	TRICONIX (ONLY TUV APPROVED APPLICATIONS)
	M/s	BRISTOL BABCOCK
	M/s	EMERSON PROCESS MANAGEMENT ( INDIA) PVT LTD.

	M/s	ICS TRIPLEX
	M/s	LARSON AND TOUBRO LTD
	M/s	SCHNEIDER ELECTRIC INDIA PVT LTD
<b>82</b>	<b>PORTABLE CALIBRATOR</b>	
	M/s	FLUKE
	M/s	DRUCK (NOW GE SENSING)
	M/s	BEAMAX
<b>83</b>	<b>AUTO SAMPLER</b>	
	M/s	JISKOOT LTD, UK
	M/s	CLIFF MOCK
	M/s	WELKER ENGINEERING COMPANY PTE LTD, SINGAPORE
<b>84</b>	<b>DRAFT GAUGES</b>	
	M/s	AN INSTRUMENTS PVT LTD INDIA
	M/s	BADOTHERM PROCESS INSTRUMENTS B.V. NETHERLANDS
	M/s	BOURDON HAENNI S.A FRANCE
	M/s	BUDENBERG GAUGE CO. LTD U.K.
	M/s	DRESSER INC. U.S.A
	M/s	GENERAL INSTRUMENTS CONSORTIUM INDIA
	M/s	NAGANO KEIKI SEISAKUSHO LTD JAPAN
	M/s	SWITZER INSTRUMENT LTD INDIA
	M/s	WIKA ALEXANDER WIEGAND & CO GMBH GERMANY
<b>85</b>	<b>FLOW ELEMENTS (VENTURI, FLOW NOZZLES)</b>	
	M/s	FMC MEASUREMENT SOLUTIONS-UK U.K.
	M/s	GENERAL INSTRUMENTS CONSORTIUM INDIA
	M/s	INSTRUMENTATION LTD. (PALGHAT) INDIA
	M/s	MICRO PRECISION PRODUCTS PVT LTD INDIA
	M/s	STAR-MECH CONTROLS (INDIA) PVT LTD INDIA
	M/s	TM TECNOMATIC SPA
<b>86</b>	<b>INSTRUMENT VALVES &amp; MANIFOLDS</b>	
	M/s	ANDERSON GREENWOOD CROSBY U.S.A.
	M/s	ASTEC VALVES & FITTINGS PVT. LTD. INDIA
	M/s	AURA INC. INDIA
	M/s	AUTOCLAVE ENGINEERS FLUID COMPONENTS U.S.A.
	M/s	CHEMTROLS ENGINEERING LTD INDIA
	M/s	CIRCOR INSTRUMENTATION LTD(FORM. H608) U.K.
	M/s	EXCEL HYDRO PNEUMATICS PVT LTD INDIA
	M/s	EXCELSIOR ENGG. WORKS INDIA

	M/s	HAM-LET (ISRAEL-CANADA) LTD. ISRAEL
	M/s	HYD-AIR ENGG. WORKS LONAVLA INDIA
	M/s	MICRO PRECISION PRODUCTS PVT LTD INDIA
	M/s	PARKER HANNIFIN CORPORATION U.S.A.
	M/s	PRECISION ENGINEERING INDUSTRIES INDIA
	M/s	PRIME ENGINEERS INDIA
	M/s	SWAGELOK CO. U.S.A.
	M/s	SWASTIK ENGINEERING WORKS INDIA
	M/s	TECNOMATIC INDIA PVT LTD INDIA
	M/s	HAVI ENGINEERING INDIA PVT. LTD., THANE
	M/s	PANAM ENGINEERS LIMITED, MUMBAI
<b>87</b>	<b>PILOT OPERATED SAFETY VALVE</b>	
	M/s	ANDERSON GREENWOOD CROSBY U.S.A.
	M/s	CURTISS WRIGHT FLOW CONTROL CORPORATION USA, CANADA/UK
	M/s	DRESSER INC. U.S.A.
	M/s	SAFETY SYSTEMS UK LTD U.K.
	M/s	TAI MILANO SPA ITALY
	M/s	TYCO SANMAR LTD INDIA
	M/s	WEIR VALVES & CONTROLS FRANCE (FORM S791) FRANCE
<b>87 A</b>	<b>CONVENTIONAL / BELLOWS SAFETY VALVE</b>	
	M/s	BRIGHTCH
	M/s	SAFECON VALVE
	M/s	HTC LTD
	M/s	ALIKRAFT
<b>88</b>	<b>PR.REGULATOR &amp; SLAM SHUT VALVE</b>	
	M/s	ELSTER-INSTROMET NV-FORMER. I563 BELGIUM
	M/s	EMERSON PROCES MGMT ASIA PACIFIC PTE LTD SINGAPORE
	M/s	GORTER CONTROLS B.V. NETHERLANDS
	M/s	MOKVELD VALVES BV NETHERLANDS
	M/s	PIETRO FIORENTINI SPA ITALY
	M/s	RMG REGEL+MESSTECHNIK GMBH GERMANY
<b>89</b>	<b>SKIN THERMOCOUPLES</b>	
	M/s	ABB AUTOMATION LTD U.K
	M/s	DAILY THERMETRICS U.S.A
	M/s	DETRIV INSTRUMENTATION & ELECTRONICS LTD INDIA
	M/s	GAYESCO LLC U.S.A
	M/s	GENERAL INSTRUMENTS CONSORTIUM INDIA
	M/s	JAPAN THERMOWELL CO LTD JAPAN
	M/s	NAGMAN SENSORS PVT LTD INDIA
	M/s	PYRO-ELECTRIC INSTRUMENTS GOA PVT LTD INDIA
	M/s	THERMO ELECTRIC CO. INC. U.S.A
	M/s	THERMO-COUPLE PRODUCTS CO U.S.A

	M/s	THERMO-ELECTRA B.V NETHERLANDS
	M/s	TM TECNOMATIC SPA ITALY
<b>90</b>	<b>SPECIAL CONTROL VALVES</b>	
	M/s	DRESSER PRODUITS INDUSTRIELS FRANCE
	M/s	DRESSER VALVE INDIA PVT LTD INDIA
	M/s	EMERSON PROCES MGMT ASIA PACIFIC PTE LTD SINGAPORE
	M/s	FLOWSERVE PTE LTD SINGAPORE
	M/s	ITALVALV S.N.C ITALY
	M/s	KITAMURA VALVE MANUFACTURING CO LTD JAPAN
	M/s	METSO AUTOMATION PTE LTD(FORMERLY NELES) U.K.
	M/s	MOTOYAMA ENGG WORKS LTD JAPAN
	M/s	NUOVO PIGNONE SPA (ITALY) (GE OILCO.) ITALY
	M/s	SAMSON AG MESS-UND REGELTECHNIK GERMANY
	M/s	SPX VALVES & CONTROLS (FORMERLY DEZURIK) U.S.A.
	M/s	WEIR VALVES & CONTROLS UK LTD U.K.
<b>91</b>	<b>MAGNETIC LEVEL INSTRUMENTS</b>	
	M/s	ASIAN INDUSTRIAL VALVES & INSTRUMENTS INDIA
	M/s	BLISS ANAND PVT LTD INDIA
	M/s	CHEMTROLS ENGINEERING LTD INDIA
	M/s	K-TEK CORPORATION U.S..A
	M/s	KLINGER FLUID CONTROL GMBH (FORM.R551) AUSTRIA
	M/s	KROHNE MESSTECHNIK GMBH & CO KG GERMANY
	M/s	KSR KUEBLER NIVEAUMESS-TECHNIK AG GERMANY
	M/s	LEVCON INSTRUMENTS PVT LTD INDIA
	M/s	MAGNETROL INTERNATIONAL N.V BELGIUM
	M/s	NIHON KLINGAGE CO LTD JAPAN
	M/s	PHOENIX SYSTEMLEMENTE UND MESSTECHNIK GERMANY
	M/s	PRATOLINA INSTRUMENTS PVT LTD INDIA
	M/s	TECNOMATIC INDIA PVT LTD INDIA
	M/s	V AUTOMAT & INSTRUMENTS PVT LTD INDIA
<b>92</b>	<b>SPECIAL LEVEL INSTRUMENTS (RF TYPE)</b>	
	M/s	AMETEK DREXELBROOK U.S.A
	M/s	ENDRESS + HAUSER GMBH & COMPANY GERMANY
	M/s	K-TEK CORPORATION U.S.A
	M/s	MAGNETROL INTERNATIONAL N.V BELGIUM
	M/s	MOBREY LTD (FORM. S-578) ENGLAND
<b>93</b>	<b>SPEED TANSMITTERS</b>	



	M/s	ASEA BROWN BOVERY LIMITED SWITZERLAND
	M/s	HANS TURCK GMBH & CO. KG GERMANY
	M/s	JAPAN SERVO CO LTD JAPAN
	M/s	PEPPERL + FUCHS GMBH GERMANY
<b>94</b>	<b>SPL. LEVEL INSTRUMENTS-GUIDED WAVE RADAR</b>	
	M/s	EMERSON PROCESS MANAGEMENT INDIA PVT LTD INDIA
	M/s	ENDRESS + HAUSER GMBH & COMPANY GERMANY
	M/s	K-TEK CORPORATION U.S.A.
	M/s	KROHNE MESSTECHNIK GMBH & CO KG GERMANY
	M/s	L & J TECHNOLOGIES U.S.A.
	M/s	MAGNETROL INTERNATIONAL N.V BELGIUM
	M/s	TOKYO KEISO CO LTD JAPAN
<b>95</b>	<b>TEMPERATURE RECORDERS</b>	
	M/s	ABB AUTOMATION LTD U.K.
	M/s	HONEYWELL INC U.S.A
	M/s	INVENSYS SOFTWARE SYSTEMS (S) PTE LTD SINGAPORE
	M/s	YAMATAKE CORPORATION LTD. JAPAN
	M/s	YOKOGAWA ELECTRIC CORPORATION JAPAN
	M/s	YOKOGAWA INDIA LTD. INDIA
<b>96</b>	<b>RUPTURE DISCS</b>	
	M/s	BS & B SAFETY SYSTEMS (INDIA) LTD INDIA
	M/s	BS&B SAFETY SYSTEMS INC U.S.A.
	M/s	ELFAB HUGHES LTD U.K
	M/s	FIKE EUROPE N.V. BELGIUM
	M/s	OKLAHOMA SAFETY EQUIPMENTS CO. INC. SINGAPORE
	M/s	REMBE GMBH SAFETY+CONTROL GERMANY
	M/s	SAFETY SYSTEMS UK LTD (MARSTON DIVN) U.K.
<b>97</b>	<b>PLANT COMMUNICATION SYSTEM (PAGA)</b>	
	M/s	INDUSTRONIC GMBH
	M/s	NEUMAN ELEKTRONIK GMBH & CO
	M/s	SIEMENS AG
	M/s	FEDERAL SIGNAL CORPORATION
	M/s	CONTROL PTE LTD, SINGAPORE-139948
	M/s	ARMTEL LLC, RUSSIA
<b>98</b>	<b>FIRE ALARM SYSTEMS</b>	

	M/s	HONEYWELL AUTOMATION INDIA LTD - FORM .T115 (H150)	TYPE: ANALOGUE ADDRESSABLE
	M/s	NEW FIRE ENGINEERS (P) LTD (N075)	TYPE: 1.CONVENTIONAL,2.ANALOGUE ADDRESSABLE(KEY MODULES,ENGG AND BACK UP SUPPORT SHALL BE FROM M/S SIEMENS BUILDING TECHNOLOGIES INC),PANEL AND CRITICAL COMPONENTS SHALL BE CLIENT APPROVED
	M/s	TYCO FIRE & SECURITY INDIA PVT LTD (T026)	SCOPE: 1. M/S TYCO FIRE AND SECURITY(TFS)-INDIA:ENQUIRY RECEIPY,OFFER , ORDER AND DRGS. SUBMISSION,PANEL SOURCING,SAT.2. M/S TYCO SAFETY PRODUCTS(TSP) -USA: ASSEMBLY/MOUNTING OF CPU ,MODULE,COMP. WIRING,TESTING ,FAT
	M/s	UTC FIE & SECUTIRY INDIA LTD - FORM. K125 (U115)	TYPE: CONVENTIONAL AND ANALOGUE ADDRESSABLE SYSTEMS SHALL BE OFFERED EITHER OF M/S AUTRONICA OR EDWARD BRAND
<b>99</b>	<b>SPECIAL LEVEL INSTRUMENTS (TUNNING FORK)</b>		
	M/s	AMETEK DREXELBROOK U.S.A.	
	M/s	ENDRESS + HAUSER GMBH & COMPANY GERMANY	
	M/s	K-TEK CORPORATION U.S.A.	
	M/s	MOBREY LTD (FORM. S-578) ENGLAND	
	M/s	NIVO CONTROLS PVT LTD INDIA	
	M/s	VEGA GRIESHABER KG GMBH GERMANY	
	M/s	VENTURE MEASUREMENT COMPANY U.S.A.	
<b>100</b>	<b>AMBIENT AIR QUALITY/STACK EMISSION MONITORING SYSTEM</b>		
	M/s	Vashti Engineers Pvt Ltd, Guntur	
<b>101</b>	<b>SUSPENDED PARTICULATE MATTER (SPM) MEASUREMENT SYSTEM (IN AMBIENT AIR)</b>		
	M/s	Polltech Instruments Pvt Ltd, Mumbai	
<b>102</b>	<b>LEAK DETECTION SYSTEM</b>		

	M/s	KROHNE OIL AND GAS B.V.	(Through M/S EXIMP MEASUREMENTS PVT. LTD.), PUNE		
	M/s	ENERGY SOLUTIONS INTERNATIONAL (INDIA) PVT. LTD. HYDERABAD			
103	HIPPS (High -Integrity Pressure Protection System)				
	M/s	Rotex Manufacturers and Engineers Pvt. Ltd.			
		Approved with following vendor components:			
		SI No	Name of HIPPS component	Name of Component vendor	Country
		1	Ball Valve	Rotex	India
		2	Actuator	Rotex	India
		3	Pressure Transmitter	Honeywell	India
		4	Logic Solver	Emerson	India or Singapore
		5	Solenoid Valve	Rotex	India
		6	High Integrity Pressure Manifold	Astava	The Netherlands

# **ELECTRICAL**

	Name Of Vendor	Remarks
<b>1. BATTERY (NI-CD / LEAD ACID/ VRLA)</b>		
	M/s EXIDE INDUSTRIES LIMITED	
	M/s STANDARD	
	M/s AMCO SAFT INDIA LTD	
	M/s SABNIFE	
	M/s AMARA RAJA POWRER SYSTEMS (P) LTD	
	M/s CHLORIDE SYSTEM, UK/France	
	M/s HBL POWER SYSTEMS LTD	
	M/s FUJI, JAPAN	
	M/s YUASA , JAPAN	
	M/s SAFT POWER SYSTEM, USA	
	M/s KIRLOSKAR BATTERIES PVT LTD	
<b>2. UPS SYSTEM</b>		
	M/s DB POWER ELECTRONICS (P) LTD	
	M/s TATA LEIBERT	
	M/s HITACHI HI-REL POWER ELECTRONICS PVT LTD	
	M/s INSTRUMENTATION LTD.	
	M/s AMARA RAJA	
	M/s SABNIFE	
	M/s SIEMENS LTD	
	M/S STAND BY POWER , USA	
	M/s CHLORIDE SYSTEM , UK/ FRANCE	
	M/s FUJI , JAPAN	
	M/s GUTOR, SWITZERLAND.	
	M/s EMERSON, USA	
	M/s APLAB LIMITED, THANE	
	M/s VERTIV ENERGY PRIVATE LTD, THANE	TRANSISTORISED, SINGLE PHASE, RATING : UPTO 0-130KVA
	M/S BORRI S.P.A., ITALY	
<b>3. PROTECTION RELAY</b>		
	M/s ALSTOM	
	M/S ABB INDIA LIMITED, BENGALURU	
	M/s GE INDIA INDUSTRIAL PVT LTD	
	M/S EASUN REYROLLE LTD	CONVENTIONAL AND NUMERICAL TYPE WITH 400V DESIGN

	M/S AREVA T&D INDIA LTD	CONVENTIONAL AND NUMERICAL TYPE,MNF LOCATION :PALLAVARAM CHENNAI
	M/S LARSEN & TOUBRO LTD	NUMERICAL TYPE : P&B ENGINEERING U.K. MAKE
	M/s SIEMENS LTD	TYPE : NUMERICAL, BRAND: SIPROTEC&REYROLLE
	M/S SCHNEIDER ELECTRIC INDIA PVT LTD	TYPE: NUMERICAL
<b>4.</b>	<b>EARTH LEAKAGE RELAY</b>	
	M/s DATAR SWITCHGEAR PVT LTD	
	M/s HH ELECON	
	M/s OZR	
	M/s PRAYOG.	
	M/s PROK DEVICES PVT. LTD.	With CBCTs
<b>5.</b>	<b>AUXILIARY RELAY</b>	
	M/S ABB INDIA LIMITED, BENGALURU	
	M/s JYOTI LTD	
	M/s ALSTOM	
	M/s GE INDIA INDUSTRIAL PVT LTD	
	M/S AREVA T&D INDIA LTD (T&D GROUP)	MNF. LOCATION:PALLAVARAM,CH ENNAI
<b>6.</b>	<b>LT SWITCHGEAR</b>	
	M/s SIEMENS LTD	
	M/s LARSEN &TOUBRO LTD	
	M/s SCHNEIDER ELECTRIC LTD	
	M/s ALSTOM	
	M/s GE INDIA INDUSTRIAL PVT LTD	
	M/s TERASAKI, SINGAPUR/JAPAN	
	M/s FUJI LTD	
	M/s HITACHI	
	M/s GE COMPANY UK	
<b>7.</b>	<b>CONTROL SWITCH</b>	
	M/s ABB LTD	
	M/s LARSEN &TOUBRO LTD	
	M/s CGL	
	M/s KAYCEE INDUSTRIES LTD	
	M/s SIEMENS LTD	
	M/s GE INDIA INDUSTRIAL PVT LTD	
	M/s THAKORE	

	M/s ESSEN	
	M/s BCH ELECTRIC LTD	
	M/S RELIABLE ELECTRONIC COMPONENTS PVT LTD	
	M/S SWITRON DEVICES	FOR BREAKERS: RATING 660V/32A, OTHERS: TYPE CAM (440V/10A) ROTARY (440V/63A)
	M/S HOTLINE SWITCHGEAR & CONTROLS	
	M/S AREAVA T&D,India LTD	Chennai
<b>8.</b>	<b>TIMER</b>	
	M/s SIEMENS LTD	
	M/s LARSEN & TOUBRO LTD	
	M/s G I C	
	M/s MINILEC.	
	M/s BCH ELECTRIC	
	M/s ELECON CLIPSAL	
	M/s GE INDIA INDUSTRIAL PVT LTD	
	M/S ELECTRONIC AUTOMATION PVT LTD	
<b>9.</b>	<b>INSTRUMENT &amp; METER</b>	
	M/s LARSEN & TOUBRO LTD	
	M/s AUTOMATIC ELECTRIC LTD	
	M/s ALSTOM	
	M/s MECO INSTRUMENTS PVT LTD	
	M/s IMP	
	M/s SIMCO	
	M/s UNIVERSAL ELECTRIC	
	M/s RISHAB INSTRUMENTS PVT LTD	
	M/s SECURE	
	M/s CG POWER AND INDUSTRIAL SOLUTIONS LIMITED, MUMBAI	
	M/S NIPPEN ELECTRICAL INSTRUMENTS PVT LTD	
<b>10.</b>	<b>LDB / MLDB / DCDB</b>	
	M/S ABB INDIA LIMITED, BENGALURU	
	M/s ALSTOM	
	M/s MDS	
	M/s INDO ASIAN SWITCHGEARS	
	M/s UNIVERSAL ELECTRICS	
	M/s ELECMECH SWITCHGEARS & INSTRUMENTATION	

	M/s SIEMENS LTD	
	M/s STANDARD	
	M/s SCHNEIDER ELECTRIC INDIA LTD	
	M/s HAVELLS	
	M/s G E POWER CONTROLS	
	M/s MORARJI DORMAN, MUMBAI	
	M/s VERSATRIP CIRCUIT BREAKER MFG. LTD, MUMBAI	
	M/s BCH ELECTRIC LTD	
	M/s REUNION ENGG, MUMBAI	
	M/s FABRICON, MUMBAI	
	M/s WILSON & CO. INDIA.	
	M/S C & S ELECTRIC LTD	MANUFACTURED AT C-59, PHASE - II, NOIDA, AND HARIDWAR
	M/S CONTROL & SCHEMATICS LTD	
	M/S GE INDUSTRIAL PVT LTD	MANUFACTURING LOCATION BANGLORE
	M/S LARSEN & TOUBRO LTD	MANUFACTURING AT AHMEDNAGAR
	M/S M K ENGINEERS & CONTROLS PVT LTD	
	M/S HBL POWER SYSTEMS LTD, HYDERABAD	For DCDB
<b>11.</b>	<b>EARTH LEAKAGE CIRCUIT BREAKER</b>	
	M/s DATAR	
	M/s INDO-ASIAN FUSEGEAR LTD	
	M/s MDS	
	M/S HAVELLS INDIA LTD	
	M/s GE INDIA INDUSTRIAL PVT LTD	
	M/s SIEMENS LTD	
	M/s LARSEN & TOUBRO LTD HAGER	
	M/s SCHNEIDER ELECTRIC INDIA LTD.	
	M/s ELECON CLIPSAL	
	M/S ABB INDIA LIMITED, BENGALURU	
	M/S LEGRANT (INDIA) PVT LTD	
<b>12.</b>	<b>CABLE POWER (HV &amp; MV) &amp; CONTROL</b>	
	M/s ASIAN CABLE & INDUSTRIES LTD	
	M/s CABLE CORPORATION OF INDIA LTD	
	M/s FORT GLOSTER INDUSTRIES LTD	
	M/s INDUSTRIAL CABLES (I) LTD	
	M/s UNIVERSAL CABLES LTD	
	M/s TORRENT CABLES LTD	



	M/s INCAB	
	M/s FINOLEX CABLES LTD	
	M/s NICCO CORPORATION LTD	
	M/s RALISON ELECTRICAL PVT. LTD., NEW DELHI	
	M/s KEI INDUSTRIES LTD MUMBAI	
	M/s KUKDONG ELECTRIC , KOREA	
	M/s PIRELLI, ITALY	
	M/s POLYCAB WIRES PVT LTD, MUMBAI	
	M/s ASSOCIATED FLEXIBLES AND WIRES	
	M/s RPG CABLE CO.	
	M/S HAVELLS INDIA LTD	VOLTAGE GRADE : UPTO 11KV (E)
	M/S KEC INTERNATIONAL LTD	VOLTAGE GRADE : UPTO 33KV (E)
	M/S CORD CABLE INDUSTRIES LTD	VOLTAGE GRADE: UPTO 1.1KV
	M/S GEMSCAB INDUSTRIES LTD	VOLTAGE GRADE: UPTO 1.1KV
	M/S ASSOCIATED CABLES LTD	CONTROL CABLES
	M/S CMI LTD	CONTROL CABLES
	M/S DELTON CABLES LTD	CONTROL CABLES
	M/S EVERSHINE ELECTRICALS	CONTROL CABLES
	M/S ELKAY TELELINKS LTD	CONTROL CABLES UPTO 37 CORES
	M/S ECO CABLES PVT LTD	CONTROL CABLES UPTO 61 CORES
	M/S NORTH EASTERN CABLES PVT LTD	CONTROL CABLES UPTO 61 CORES
	M/S PARAMOUNT COMUNICATION LTD	MANUFACTURING UNIT PARAMOUNT CABLES CORPORATION (CONTROL CABLES)
	M/S SRIRAM CABLES PVT LTD	CONTROL CABLES
	M/S SCOT INNOVATION WIRES & CABLES PVT LTD	CONTROL CABLES
	M/S SUYOG ELECTRICALS LTD	CONTROL CABLES
	M/S THERMO CABLES LTD	CONTROL CABLES
<b>13.</b>	<b>CABLE GLAND</b>	
	M/s VICTORY	
	M/s ALAKH	
	M/s BEECO	

	M/s FCG	
	M/s COMET	
	M/s HMI	
	M/s POWER ENGG.	
	M/S DAEBONG ACROTEC CO.LTD	HAZARDOUS AREA, MFG AT BANGLORE WORKS
	M/S DAEKYUNG MACHINERY & ENGINEERING CO.LTD	HAZARDOUS AREA
	M/S DAEKYUNG TECHNOS CO LTD (SOUTH KOREA)	HAZARDOUS AREA
	M/S HITACHI ZOSEN COORPORATION	HAZARDOUS AREA
	M/S KNM PROCESS SYSTEMS SDN BHD	HAZARDOUS AREA
	M/S ROLLE. S.P.A.	HAZARDOUS AREA
	M/S SUNGJIN GEOTECHCO LTD	HAZARDOUS AREA, WORKS DAMAN(KACHIGAM)
	M/S WELDERS NV	HAZARDOUS AREA
	M/S SUDHIR SWTICHGEAR PVT LTD	HAZARDOUS AREA
	M/S STANDARD METAL INDUSTRIES	HAZARDOUS AREA
<b>14.</b>	<b>CABLE LUG</b>	HAZARDOUS AREA
	M/s DOWELLS	HAZARDOUS AREA
	M/s USHA ISMAL	HAZARDOUS AREA
	M/s JENSON	HAZARDOUS AREA
<b>15.</b>	<b>METAL CLAD PLUG &amp; SOCKET (INCLUDING WELDING SOCKET)</b>	
	M/s BHARTIA CUTLER HAMMER	
	M/s BEST & CROMPTON	
	M/s SCHNEIDER ELECTRIC INDIA LTD	
	M/s RB (RYROL BURN)	
<b>16.</b>	<b>FLAMEPROOF PLUG / SOCKET / HAND-LAMP</b>	
	<b>(DGMS approved with approval No. and certificate for specific model type)</b>	
	M/S BALIGA LIGHTING EQUIPMENTS (P) LIMITED	
	M/S FLEXPOR ELECTRICAL PVT LTD	
	M/S FLAMPROOF EQUIPMENTS PVT LTD	RATING UP TO 63 AMP
	M/S FCG POWER INDUSTRIES PVT LTD	
	M/S FCG FLAMPROOF CONTROL GEARS P LTD	WORKS DAMAN (KACHIGAM)
	M/S GOVAN INDUSTRIES (INDIA) P LTD	PLUGS AND SOCKETS ONLY
	M/S SUDHIR SWITCHGEARS PVT LTD	
<b>17.</b>	<b>LIGHT FIXTURE (NON FLAME PROOF)</b>	
	M/s PHILIPS ELECTRONICS INDIA LTD	
	M/S CG POWER AND INDUSTRIAL SOLUTIONS LIMITED, MUMBAI	

	M/s BAJAJ ELECTRICALS LTD	
	M/S HAVELLS INDIA LTD	MANUFACTURER: M/S G S LIGHTINGS P LTD-GURGAON
<b>18.</b>	<b>HRC FUSE / BASE</b>	
	M/s GEC ALSTOM,	
	M/s SEIMENS LTD	
	M/s LARSEN & TOUBRO LTD	
	M/s HH ELECON	
	M/S COOPER BUSSMAN INDIA PVT LTD	MV AND HV
	M/S GE INDIA INDUSTRIAL PVT LTD	MANUFG LOCATION: BANGLORE
	M/S INDO ASIAN INDUSTRIAL PVT LTD	MANUFG LOCATION: SONEPAT
<b>19.</b>	<b>INDICATING LAMP / FITTING</b>	
	M/s TELEMIC	
	M/s SEIMENS LTD	
	M/s LARSEN & TOUBRO LTD	
	M/s RAS CONTROLS	
	M/S ESSEN DEINK	
	M/S HOTLINE SWITCHGEAR & CONTROLS	
	M/S PRECIFINE PRODUCTS PVT LTD	
	M/SSHRI TULSI SWITCHGEARS PVT LTD	
	M/S SCHNEIDER ELECTRIC INDIA PVT LTD	
	M/S TEKNIC CONTROLS	
<b>20.</b>	<b>Deleted</b>	
<b>21.</b>	<b>415V SWITCHGEAR PANEL (PMCC / MCC)</b>	
	M/s LARSEN & TOUBRO LTD	
	M/s SIEMENS LTD	
	M/s SCHNEIDER ELECTRIC INDIA LTD	
	M/s ALSTOM	
	M/s ELECMECH SWITCHGEARS & INSTRUMENTATION	
	M/s G E POWER CONTROLS	
	M/S ABB INDIA LIMITED, BENGALURU	MCC, PCC, PMCC, AIR CIRCUIT BREAKERS SHALL BE FROM ABB-ITALY, MFG. AT NEELMANGLA BANGLORE
	M/S BCH ELECTRIC LTD., NEW DELHI	
	M/S C & S ELECTRIC LTD	TYPE : MCC, PCC, PMCC MFG. AT C-59, PHASE - II, NOIDA AND HARIDWAR

	M/S CONTROLS & SCHEMATICS LTD	TYPE : MCC, PCC, PMCC, RATING UPTO 1600 AMP
	M/S GE INDIA INDUSTRIAL PVT LTD	TYPE : MCC, PCC, PMCC, MFG. LOCATION BANGALORE
	M/s L K Nes Singapur	
	M/s Pan Electric	
	M/s Terasaki, Singapur/Japan	
	M/s Hitachi	
	M/s HELCO	
	M/s IME Quadri, USA	
	M/s Nuovo Magini, Italy	
<b>22.</b>	<b>TRANSFORMER (LTG / CONTROL / POTENTIAL / CURRENT / AUTO)</b>	
	M/s AUTOMATIC ELECTRIC LTD	
	M/s KAPPA ELECTRICALS	
	M/s INDCOIL TRANSFORMERS PVT LTD	
	M/s VOLTAMP TRANSFORMERS LTD	
	M/s LOGIC CONTROLS	
	M/S ABB INDIA LIMITED, BENGALURU	
	M/s JYOTI	
	M/s PRAYOG ELECTRICALS	
	M/s GILBERT & MAXWELL	
	M/s PRECISE ELECTRICAL	
	M/s PRAGATI ELE CTRICAL PVT LTD	
	M/s LARSEN & TOUBRO LTD	
	M/s ASHMOR	
	M/s NIKSAN	
	M/s SIEMENS LTD	
	M/s ALSTOM	
	M/s CONTROLS & SWITCHGEAR LTD.	
	M/S GUJARAT PLUG IN DEVICES PVT LTD	LTG TRF UPTO 100KVA
	M/S AREVA T & D INDIA LTD (T & D GROUP)	CURRENT TRANSFORMERS FOR PROTECTION AND METERING ,VOLTAGE RATING UPTO 11KV,MNFR. M/S BMC ELETROPLST P LTD-KOLKATA
	M/S ELECTRICALS CONTROLS & SYSTEMS	INSTRUMENT TRANSFORMERS (HV)

	M/S KALPA ELECTRICAL PVT LTD	INSTRUMENT TRANSFORMERS MV TYPE:CURRENT TRANSFORMERS,RATING UPTO 3000/5A,38.41 KA HV TYPE: CURRENT TRANSFORMERS,RATING UPTO 2000/5A,40KA
	M/S GILBERT & MAXWELL ELECTRICAL PVT LTD	INSTRUMENT TRANSFORMERS
	M/S NARYAN POWERTECH PVT LTD	INSTRUMENT TRANSFORMERS (MV): CT UPTO 33KV,500 AMP,PT UPTO 33KV
	M/S SILKANNA ELECTRICALS MFG. CO.PVT. LTD	INSTRUMENT TRANSFORMERS (MV)
<b>23.</b>	<b>AIR CIRCUIT BREAKER</b>	
	M/s LARSEN & TOUBRO LTD	
	M/s SIEMENS LTD	
	M/s ALSTOM	
	M/s SCHNEIDER ELECTRIC INDIA LTD.	
	M/S ABB INDIA LIMITED, BENGALURU	
	M/s GE INDIA INDUSTRIAL PVT LTD	
	M/S C&S ELECTRIC LTD	MFG AT A-7 & 8, SECTOR 8 NOIDA
	M/s TERASAKI, SINGAPUR/JAPAN	
	M/s FUJI	
	M/s GE COMPANY, UK	
	M/S HITACHI	
<b>24.</b>	<b>AUTO TRANSFORMER STARTER</b>	
	M/s LARSEN & TOUBRO LTD	
	M/s SIEMENS LTD	
	M/s ALSTOM	
	M/s ELECMECH SWITCHGEARS & INSTRUMENTATION	
	M/s BCH	
<b>25.</b>	<b>BATTERY CHARGER</b>	
	M/s CHHABI ELECTRICAL PVT LTD	
	M/s AUTOMATIC ELECTRIC LTD	
	M/s SAB-NIFE POWER SYSTEMS LTD	
	M/s UNITED ELECTRIC	
	M/s ELCOT POWER CONTROLS LTD	

	M/s SERVILINK	
	M/s USHA	
	M/s INTERNATIONAL RECTIFIER	
	M/s UNIVERSAL INDUSTRIAL PRODUCTS	
	M/s SAB - NIFE, SWEDEN	
	M/s STANDBY POWER SYSTEM, USA	
	M/s YUASA, JAPAN	
	M/s CHLORIDE SYSTEM, UK/France	
	M/s GUTOR, SWITZERLAND	
	M/s FUJI, JAPAN	
	M/s EMERSON, USA	
	M/s SAFT POWER SYSTEM, USA	
	M/S AMARA RAJA POWER SYSTEMS (P) LTD	24V DC-600A/110V DC-250/220V DC-150A
	M/S CALDYNE AUTOMATICS LTD	OUTPUT VOLTAGE : 220V DC (MAX), RATING, 1000AH (MAX)
	M/S DUBAS ENGINEERING PVT LTD	RATING : UPTO 220 VDC, 400 AMP
	M/S HBL POWER SYSTEMS LTD	RATING : UPTO 220 VDC, 400 AMP
	M/S MASS TECH CONTROLS PVT LTD	RATING : a) 220V, UPTO 500A, b) 110V, UPTO 150A, c) 24V, UPTO 600A
	M/S UNIVERSAL INSTRUMENT MFG CO PVT LTD	RATING : UPTO 220 VDC, 400 AMP
<b>26.</b>	<b>ENERGY METER</b>	
	M/s AUTOMATIC ELECTRIC LTD	
	M/s ALSTOM / IMP / SIMCO	
	M/s JAIPUR METALS & ELECTRICALS	
	M/s LARSEN & TOUBRO LTD	
	M/s GEB	
	OR AEC approved vendor for main metering.	
<b>27.</b>	<b>TERMINATION / JOINTING KIT</b>	
	M/s CABLE CORPORATION OF INDIA LTD	
	M/s RAYCHEM RPG LTD	
	M/s M-SEAL	
	M/s DENSON	
	M/s PIDILITE	
	M/S HEATSRINK TECHNOLOGIES LTD	UPTO 33 KV (E )
	M/S THREE M ELCTRO & COMMUNICATION I.P. LTD	UPTO 33 KV

	M/S YAMUNA POWER & INFRASTRUCTURE LTD	UPTO 33 KV(E)
<b>28.</b>	<b>METAL CLAD SWITCH, DB WITH HRC / RE-WIRABLE FUSE,CHANGEOVER SWITCH</b>	
	M/s LARSEN & TOUBRO LTD	
	M/s SIEMENS LTD	
	M/s GE India Industrial Pvt Ltd	
	M/s CONTROL & SWITCHGEAR	
	M/s ALSTOM	
	M/S CG POWER AND INDUSTRIAL SOLUTIONS LIMITED, MUMBAI	
	M/s ELECON-CLIPSAL	
	M/s KEW	
	M/s INDO-ASIAN	
	M/s HAVELLS.	
<b>29.</b>	<b>LIGHTNING ARRESTOR</b>	
	M/s ELPRO INTERNATIONAL LTD	
	M/s ALSTOM	
	M/s OBLUM ELECTRICAL INDUSTRIES P LTD	
	M/s LAMCO	
	M/s ATLAS	
	M/S CG POWER AND INDUSTRIAL SOLUTIONS LIMITED, MUMBAI	
	M/S W.S. INSULATOR OF INDIA	
<b>30.</b>	<b>NEUTRAL GROUNDING RESISTOR</b>	
	M/s RSI SWITCHGEAR PVT LTD	
	M/s BHARTIA CUTLER HAMMER LTD	
	M/S RESITECH ELECTRICALS PVT LTD (HV)	
	M/S S R NARKHEEDE ENGINEERING PVT LTD (HV)	
<b>31.</b>	<b>MOTOR</b>	
	M/s BHARAT BIJLEE LTD	
	M/S CG POWER AND INDUSTRIAL SOLUTIONS LIMITED, MUMBAI	
	M/s ALSTOM	
	M/s NGEF	
	M/s SIEMENS LTD	
	M/s KIRLOSKAR ELECTRIC CO. LTD	
	M/S ABB INDIA LIMITED, BENGALURU	

	M/S BHEL-BHOPAL	INDUCTION -HV I(NCREASED SAFETY ZN2 NOT QUALIFIED FOR TYPE EX'E MOROTS DUE TO LIMITATION IN TESTING FACILITIES AS PER IS-6381-2004, REF, SEC -414
	M/S MARATHON ELECTRIC MOTOR LTD (RATING:UPTO 6.6KV)	INDUCTION -HV I(NCREASED SAFETY ZN2 RATING:UPTO 6.6KV, MANF. LOCATION:1, TARATALLA ROAD - KOLKATTA, NOT QUALIFIED FOR TYPE EX'E'
	M/S LAXMI HYDRAULICS PVT LTD (MV- 63 TO 315L)	INDUCTION -MV (INDL. TYPE SAFE AREA, ZONE 2 - TYPE e & n & FLAME PROOF FRAME SIZE 63 TO 315L)
	M/s LAWRENCE SCOTT ELECTRO MOTORS , UK	
	M/s LOHER , GERMANY	
	M/s FUJI ELECTRIC COMPANY LTD, JAPAN	
	M/s PARSON PEEBLES , UK	
	M/s ASI ROBICON, ITALY	
	M/S ASEA BROWN BOVERY LTD (ABB LTD)	
	M/S CEMP SRL	TYPE:M V IND. MOTORS,a)SAFE AREA, b) INCREASED SAFETY, ZONE-2(ex n),c) FLAMEPROOF (Ex d)
	M/S GENERAL ELECTRIC CANADA	TYPE: HV SYNCHRONOUS MOTORS,APPLICATION: SAFE AREA ,Ex 'n '&Ex 'p'
	M/S HITACHI LTD	
	M/S JEUMONT SA/FRAMATONE ANP	
	M/S LLOYD DYNAMOWERKE GMBH & CO. KG	TYPE: HV IND. & HV SYN. MOTORS, APPLICATION : SAFE AREA;ZONE-2 (EX n) &Ex p
	M/S SIEMENS AG	
	M/S TOSHIBA CORPORATION	



	M/S WEG EQUIPAMENTOS ELETRICOS S.A.	TYPE: (1) Ex 'e' , 'n' , 'p', AND SAFE AREA, VOLTAGE RATING UPTO 11KV,FRAME SIZE UPTO 1000 (2) Ex 'd' VOLTAGE RATING UPTO 6.6KV, FRAME SIZE UPTO 450
<b>32.</b>	<b>SUBMERSIBLE PUMP</b>	
	M/s KSB	
	M/s KIRLOSKAR	
	M/s CALAMA	
	M/s VASP	
	M/S CG POWER AND INDUSTRIAL SOLUTIONS LIMITED, MUMBAI	
<b>33.</b>	<b>DG SET (ALTERNATOR- MV)</b>	
	M/s KIRLOSKAR	
	M/s JYOTI	
	M/s NGEF	
	M/s STAMFORD	
	M/s BHEL	
	M/s KATO	
	M/s ALSTOM	
	M/S CG POWER AND INDUSTRIAL SOLUTIONS LIMITED, MUMBAI	RATING UPTO 500 KVA
	M/S CUMMINS GENERATOR TECHNOLOGIES I LTD	RATING :30 TO 1250 KVA
	M/S LEROY SOMARE & CONTROLS INDIA PVT LTD	RATING: UPTO 2000KVA
	M/s Marelli, Italy	Up to 1125 KWe
<b>34.</b>	<b>SYNCHRONOUS (FOREIGN)</b>	
	M/S ANSALDO ENERGIA SPA	
	M/S ASEA BROWN BROVERY LTD	
	M/S AVK DEUTSCHLAND GMBH & CO KG	
	M/S FUJI ELECTRIC CO LTD	
	M/S JEUMONT SA/ FRAMATONE ANP	
	M/S MEIDENSHA CORP	
	M/S SIEMENS AG	
	M/S TOSHIBA CORPORATION	
	M/S TOYO DENKI SEIZO K.K.	
<b>34.</b>	<b>FLAMEPROOF PUSH BUTTON STATION</b>	
	<b>(DGMS approved with approval No. and certificate for specific model type).</b>	
	M/s FCGPOWER INDUSTRIES PVT LTD	

	M/s GE INDIA INDUSTRIAL PVT LTD	
	M/s BALIGA LIGHTING EQUIPMENTS (P) LTD	
	M/S FLEXPLO ELCTRICALS PVT LTD	
	M/S FLAMEPROOF EQUIPMENTS PVT LTD	
	M/S FCD FLAMPROOF CONTROL GEARS P. LTD	
	M/S GOVAN INDUSTRIES (INDIA) P LTD	
	M/S PROMPT ENGINEERING WORKS	
	M/S SUDHIR SWITCHGEARS PVT LTD	
<b>35.</b>	<b>CAPACITOR BANK</b>	
	M/S ABB INDIA LIMITED, BENGALURU	
	M/s UNIVERSAL	
	M/s INDOKEM LIMITED, MUMBAI	
	M/s YESHA	
	M/s ASIAN ELECTRONICS LTD.	
	M/s SAHA SPRAGUE	
	M/s LARSEN & TOUBRO LTD MEHER	
	M/S BCH ELECTRIC LTD	
	M/S C & S ELECTRIC LTD	MANFG AT C-58 NOIDA PHASE II
	M/S GE INDIA INDUSTRIAL PVT LTD	MANFG AT BANGLORE
	M/S SIEMENS LTD	
	M/S SCHNEIDER ELECTRIC INDIA PVT LTD	
<b>36.</b>	<b>APFC PANEL</b>	
	M/S ABB INDIA LIMITED, BENGALURU	
	M/s ALSTOM	
	M/s SIEMENS LTD	
	M/S SCHNEIDER ELECTRIC INDIA PVT LTD	
	M/s GE INDIA INDUSTRIAL PVT LTD	
	M/s SAHA SPRAGUE	
	M/s LARSEN & TOUBRO LTD	
	M/s INDOKEM LIMITED, MUMBAI	
	M/S BCH ELECTRIC LTD., NEW DELHI	
<b>37.</b>	<b>HV SWITCH GEAR</b>	
	M/s SIEMENS LTD	
	M/S ABB INDIA LIMITED, BENGALURU	
	M/s GE INDIA INDUSTRIAL PVT LTD	
	M/S CG POWER AND INDUSTRIAL SOLUTIONS LIMITED, MUMBAI	
	M/s JYOTI	
	M/s NGEF	

	M/s ALSTOM	
	M/s VOLTAS	
	M/s DANKE	
	M/s MEI	
	M/s BHEL	
	M/s DREISCHER PANICKER	
	M/s KRUGGS	
	M/s ALLIANCE	
	M/s WESTING HOUSE , USA	
	M/s FUJI , JAPAN	
	M/s HITACHI, JAPAN	
	M/s SACE, ITALY	
	M/s SIEMENS , GERMANY / INDONESIA	
	M/s AREVA T & D INDIA LIMITED , INDIA.	
	M/s SCHNEIDER ELECTRIC INDUSTRIES, FRANCE	
<b>38.</b>	<b>HT CAPACITOR BANK SYSTEM</b>	
	M/S ABB INDIA LIMITED, BENGALURU	
	M/s BHEL	
	M/S CG POWER AND INDUSTRIAL SOLUTIONS LIMITED, MUMBAI	
	M/s SHAKTI CAPACITORS LTD	
	M/s SHREEM CAPACITORS LTD	
	M/s UNIVERSAL CABLES LTD	
	M/s SIEMENS LTD	
	M/s GE INDIA INDUSTRIAL PVT LTD	
	M/s INDOKEM LIMITED, MUMBAI	
<b>39.</b>	<b>GANG OPERATED SWITCHES &amp; ISOLATORS</b>	
	M/s KRUGGS	
	M/s S&S POWER SWITCHGEAR LTD	
	M/s ABB LTD	
	M/s DANKE	
	M/s DREISHCHER PANICKAR	
	M/s HIVELUM INDUSTRIES	
	M/S PANICKER SWITCHGEAR PVT LTD	
	M/s SIEMENS LTD	UPTO 12KV, 2500 AMP, 40KA
<b>40.</b>	<b>PIN INSULATOR, PORCEILIN BUSHES, DISC, POST INSULATORS</b>	
	M/s JAYA SHREE INSULATORS	
	M/s MODERN INSULATORS	
	M/s ALSTOM	
	M/s SHESASAYEE INDUSTRIES	

<b>41. SURGE SUPPRESSORS</b>	
M/s ELPRO INTERNATIONAL	
M/s ALSTOM	
<b>42. POWER &amp; DISTRIBUTION TRANSFORMERS</b>	
M/s BHARAT BIJLEE LTD	
M/S CG POWER AND INDUSTRIAL SOLUTIONS LIMITED, MUMBAI	
M/s VOLTAMP TRANSFORMERS LTD	
M/s BHEL	
M/s KIRLOSKAR ELECTRIC CO LTD	
M/s VOLTAS	
M/s SCNEIDER ELECTRIC , FRANCE	
M/s GENRAL ELECTRIC, USA	
M/S AREVA T & D INDIA LTD (T & D GROUP)	MFG. LOCATION: NAINI, ALLAHABAD
M/S EMCO LTD	MFG. 1) THANE, RATING: UPTO 50 MVA, 220KV, 2) JALGAON UNIT -1, RATING : UPTO 20MVA 3) JALGAON UNIT - II RATING : UPTO 2 MVA , 33KV
M/S KANOVAR ELECTRICALS LTD	
M/S TRANSFORMERS & ELCTRICAL KERALA LTD	POWER TRANSFORMERS UPTO 5 MVA
M/S VIJALI ELECTRICALS LTD	RATING : UPTO 10MVA, 33KV
M/S INDO TECH TRANSFORMERS LTD	DISTRIBUTION TRANSFORMER RATING : UPTO AND INCLUDING 33KV, 5MVA
M/S RIMA TRANSFORMERS & CONDUCTORS PVT LTD	DISTRIBUTION TRANSFORMER RATING UPTO 33KV, 5MVA
M/S TRANSFORMERS & RECTIFIERS (I) LTD	DISTRIBUTION TRANSFORMER RATING UPTO 33KV, 5MVA
<b>43. FIBRE GLASS CABLE TRAYS</b>	
M/s SUPER REINFORCED PLASTICS ASSOCIATED ENGG. CORP, MUMBAI	
M/s GRIP INDIA, MUMBAI	
M/s SSB INDUSTRIES, BANGALORE	
M/s ERCON COMPOSITES, JODHPUR.	
M/s GENRAL COMPOSUTES , MUMBAI	

	M/s ENDURO, USA	
	M/s INDIANA, MUMBAI	
	M/s SUMIP COMPOSITES PVT. LTD.	
	M/s Aeron Composites Pvt. Ltd.	
<b>44.</b>	<b>SECURITY SEARCH LIGHT SYSTEM</b>	
	M/s SIGMA SEARCH LIGHT SYSTEM	
	M/s SURAKSHA PRAKASH	
<b>45.</b>	<b>FLAMEPROOF LIGHTING &amp; DISTRIBUTION BOARD</b>	
	<b>(DGMS approved with approval No. and certificate for specific model type)</b>	
	M/S BALIGA LIGHTING EQUIPMENTS (P) LIMITED	
	M/S FLEXPLO ELECTRICAL PVT LTD	
	M/S FLAMPROOF EQUIPMENTS PVT LTD	
	M/S FCG POWER INDUSTRIES PVT LTD	
	M/S FCG FLAMPROOF CONTROL GEARS P LTD	WORKS DAMAN (KACHIGAM)
	M/S SUDHIR SWITCHGEARS PVT LTD	
<b>46.</b>	<b>FLAMEPROOF JUNCTION BOX</b>	
	<b>(DGMS approved with approval No. and certificate for specific model type)</b>	
	M/S BALIGA LIGHTING EQUIPMENTS (P) LIMITED	
	M/S FLEXPLO ELECTRICAL PVT LTD	
	M/S FLAMPROOF EQUIPMENTS PVT LTD	
	M/S FCG POWER INDUSTRIES PVT LTD	
	M/S FCG FLAMPROOF CONTROL GEARS P LTD	WORKS DAMAN (KACHIGAM)
	M/S GOVAN INDUSTRIES (INDIA) P LTD (PLUGS & SOCKETS ONLY)	
	M/S SUDHIR SWITCHGEARS PVT LTD	
	M/S PROMPT ENGINEERING WORKS	
<b>47.</b>	<b>FLAME PROOF LIGHTING FIXTURES &amp; ACCESSORIES</b>	
	<b>(DGMS approved with approval No. and certificate for specific model type)</b>	
	M/S BAJAJ ELECTRICAL LTD	MANUFACTURER M/S. ALPINE ELECTRICAL MFG. CO. PVT LTD.
	M/S BALIGA LIGHTING EQUIPMENTS (P) LIMITED	
	M/S CROMPTION GREAVES LTD	APPLICATION : GAS GROUP IIA & IIB, MANUFACTURER: VICTORY LUNNINARIES
	M/S FLEXPLO ELECTRICAL PVT LTD	
	M/S FLAMPROOF EQUIPMENTS PVT LTD	UP TO 250 WATTS

	M/S FCG POWER INDUSTRIES PVT LTD	
	M/S FCG FLAMPROOF CONTROL GEARS P LTD	WORKS DAMAN (KACHIGAM)
	M/S GOVAN INDUSTRIES (INDIA) P LTD	
	M/S PROMPT ENGINEERING WORKS	
	M/S SUDHIR SWITCHGEARS PVT LTD	
	M/S A.T.X SA	FOREIGN
	M/S R STAHL SCHALTGERATE GMBH	FOREIGN
	M/S VICTOR PRODUCTS PLC	FOREIGN
<b>48. RELAY &amp; CONTROL PANEL</b>		
	M/S ABB INDIA LIMITED, BENGALURU	
	M/S AREVAT T & D INDIA LTD (T & D GROUP)	MANUF. LOCATION: PALLAVARAM CHENNAI
	M/S EASUN REYROLLE LTD	
	M/S ENPRO INDUSTRIAL AUTOMATION PVT LTD	
	M/S GE INDIA INDUSTRIAL PVT LTD	
	M/S SIEMENS LIMITED	
<b>49. SWITCH BOARD FIXED FOR PACKAGE EQUIPMENTS</b>		
	M/S ACCUSONIC CONTROLS PVT LTD	
	M/S DHARIA SWITCHGEAR & CONTROL	
	M/S ELECTRO ALLIED PRODUCTS	
	M/S LARSEN & TOUBRO LTD	MANUFACTURING AT AHMEDNAGAR
	M/S M K ENGINEERS & CONTROLS PVT LTD	
	M/S MAKTEL SYSTEM	
	M/S NITYA ELECTRO CONTROLS	
	M/S POSITRONICS PVT LTD	
	M/S POPULAR SWITCHGEARS PVT LTD	
	M/S TRICOLITE ELECTRICAL INDUSTRIES PVT LTD	WORKS FACILITIES AT 1) SAHIBABAD 2) MANESAR
	M/S UNITED ELECTRIC CO (DELHI) PVT LTD	MANUFACTURED AT GURGAON WORKS.
	M/S VIDHYUT CONTROL (INDIA) PVT LTD	
	M/S ZENITH ENGINEERING CORP.	
<b>50. SWITCH BOARD FIXED FOR PACKAGE EQUIPMENTS FLAME PROOF</b>		
	M/S BCH ELECTRIC LTD	
	M/S BALIGA LIGHTING EQUIPMENTS (P) LTD	
	M/S EX-PROTECTA	
	M/S ELECTRICAL EQUIPMENT CORPORATION	
	M/S FLEXPLO ELCTRICALS PVT LTD	

	M/S FLAMEPROOF EQUIPMENTS PVT LTD	
	M/S FCG POWER INDUSTRIES PVT LTD	
	M/S FCD FLAMPROOF CONTROL GEARS P. LTD	
	M/S GOVAN INDUSTRIES (INDIA) P LTD	
	M/S PROMPT ENGINEERING WORKS	
	M/S SUDHIR SWITCHGEARS PVT LTD	
<b>51. HIGH MAST LIGHTING SYSTEM</b>		
	M/S BAJAJ ELECTRICAL LTD	
	M/S CROMPTION GREAVES LTD	MFG. AT M/S BP PROJECTS P LTD - KOLKATTA
	M/S PHILIPS ELECTRONICS INDIA LIMITED	
<b>52. ACTUATORS - MOV</b>		
	M/S AUMA INDIA PRIVATE LTD	SAFE AND HAZARDOUS AREA APPLICATION
	M/S LIMITORQUE INDIA LTD	WEATHER PROOF AND FLAME PROOF
	M/S MARSH ENGINEERS	SAFE AREA APPLICATION
	M/S ROTORK CONTORLS INDIA LTD	SAFE AREA AND HAZARDOUS AREA
<b>53. AC VARIABLE SPEED DRIVE</b>		
	M/S ABB INDIA LIMITED, BENGALURU	TYPE: MEDIUM VOLTAGE, MODEL: ACS 800, SUPPLY FROM ABB INDIA (NEELMANGALA), PANELS FROM EIL ACCEPTED SOURCES. ASSEMBLY AND TESTIG INHOUSE
	M/S BHEL	
	M/S DANFOSS INDUSTRIES PVT LTD	TYPE: M.V, RATING: UPTO 110KW, MODULE FROM DANFOSS- DENMARK/USA, PANELS FROM EIL ACCEPTED SOURCE, INTEG AND TESTING AT CHENNAIWORKS. TESTING (MOTOR+VFD) AT MOTOR MFG WORKS FOR HIGHER RATING

	M/S EUROTHERM DEL INDIA LTD	TYPE:MEDIUM VOLTAGE,RATING UPTO 55KW
	M/S KIRLOSKAR ELECTRIC CO LTD	TYPE: MEDIUM VOLTAGE , MFG LOCATION AT MYSORE
	M/S LARSEN & TOUBRO LTD	TYPE MEDIUM VOLTAGE
	M/S ROCKWELL AUTOMATION INDIA PVT LTD	TYPE: MEDIUM VOLTAGE,MAIN POWER BLOCK AND CONTROLLER FROM M/S ROCKWELL AUTOMATION PANELAND ACC EIL APROVED SUPPLIER SYS ENGG/ASSLY/WIRING/FUNCT IONAL TESTING BY M/S ROCKWELL INDIA
	M/S SIEMENS LIMITED	TYPE: MEDIUM VOLTAGE,MAIN POWER BLOCK AND CONTROLLER FROM M/S SIEMENS- GERMANY.APPLICATION ENGG/PANEL MOUNTING AND WIRING BY M/S SIEMENS INDIA
	M/S SCHNEIDER ELECTRIC INDIA PVT LTD	TYPE: MEDIUM VOLTAGE,RATING UPTO 110KW,M/S SCHNEIDER FRANCE TO DO BASIC ENGG,VETTING OF DOC. PANELS FROM THE EIL APPRVD, SOURCES, ASSY,WIRING AND TESTING IN HOUSE
<b>54. BIMETAL RELAYS</b>		
	M/S ABB INDIA LIMITED, BENGALURU	RATING: 0.1 TO 32 A(TYPE T25),18A TO 80A(TYPE T75),29A TO 80A (TYPE T 80),CT OPERATED RELAYS 65A TO 400A
	M/S BCH ELECRIC LTD	
	M/S C & S ELECTRIC LTD	MFG AT C-58 NOIDA PHASE - II



	M/S GE INDIA INDUSTRIAL PVT LTD	
	M/S LARSEN & TOUBRO LTD	MFG AT AHMEDNAGAR
	M/S SIEMENS LIMITED	
	M/S SCHNEIDER ELECTRIC INDIA PVT LTD	
<b>55. BUS DUCTS (M.V.)</b>		
	M/S AERO ENGINEERS	
	M/S ALFA LEVAL INDIA LTD	
	M/S ALSTOM PROJECTS INDIA LIMITED	
	M/S ANUP ENGINEERING LIMITED	
	M/S BENGAL TOOLS LIMITED	
	M/S BHEL	HARIDWAR, BHOPAL
<b>56. BUS DUCT (H.V.)</b>		
	M/S BHEL	TYPE: ISOLATED PHASE
	M/S C & S ELECTRIC LTD	UPTO 11KV, MNFG AT B1,SITE IV,SURAJPUR INDUSTRIAL AREA,KASNA ROAD,GREATER NOIDA,UP AND HARIDWAR
	M/S ENPRO ENGINEERING	RATING UPTO 11KV,3000A,S.C. 40KA FOR 1 SEC
	M/S KGS ENGINEERING LTD.	RATING UPTO 11KV,2000A
	M/S NARMADA SWITCHGEAR PVT LTD	RATING UPTO 6.6KV,2000A,40KA FOR 1 SEC
	M/S UNITED ELCTRIC CO (DELHI) PVT LTD	MFG AT GURGAON WORKS
<b>57. BUCHHOLZ RELAY</b>		
	M/S ATVUS INDUSTRIES	
	M/S A J SERVICES	
<b>58. CIRCUIT BREAKER SF-6 OUTDOOR EHV</b>		
	M/S ABB INDIA LIMITED, BENGALURU	
	M/S AREVA T & D INDIA LTD (T & D GROUP)	MNF LOCATION:PADAPPAI,CHEN N AI
	M/S BHEL	
	M/S CG POWER AND INDUSTRIAL SOLUTIONS LIMITED, MUMBAI	
	M/S SIEMENS LTD	RATING 72.5 TO 420 KV,3150A,SC RATING:50KA,SUPPLY FROM AURANGABAD
<b>59. HEAVY DUTY SWITCHES</b>		

	M/S C & S ELECTRIC LTD	MANUFACTURED AT A-7&8,SECTOR 8,NOIDA
	M/S INDO ASIAN INDUSTRIAL PVT LTD	MNFG LOCATION-SONEPAT
	M/S LARSEN & TOUBRO LTD	MANUFACTURING AT AHMEDNAGAR
	M/S SIEMENS LTD	
<b>60. HEAT TRACERS</b>		
	M/S THERMON INDIA PRIVATE LIMITED	
	M/S CHROMALOX INC, USA	(Through THEIR INDIAN SUBSIDIARY M/S CHROMALOX INDIA PRECISION HEAT & CONTROL PRIVATE LIMITED)
<b>61. LIGHTING &amp; POWER PANELS (SAFE AREA)</b>		
	M/S ABB INDIA LIMITED, BENGALURU	MANUFACTURING AT HARIDWAR
	M/S C & S ELECTRIC LTD	MANUFACTURED AT C-59,PHASE II,NOIDA AND HARIDWAR
	M/S HAVELLS INDIA LTD	MANUFACTURED AT FARIDABAD
	M/S INDO ASIAN FUSEGEAR LTD	MANUFACTURING LOCATION JALANDHAR
<b>62. MCB</b>		
	M/S ABB INDIA LIMITED, BENGALURU	CURRENT RATING:FROM 0.5 AMP TO 63 AMP,MFG. AT HARIDWAR
	M/S DATAR SWITCHGEAR PVT LTD	CURRENT RATING UP TO 63 AMP(MCB+ELCB)
	M/S HAVELLS INDIA LTD	MANUFACTURED AT BADDI(HIMACHAL)
	M/S INDO ASIAN FUSEGEAR LTD (RATING UPTO 63 AMP)	MANUFACTURING LOCATION: NOIDA AND HARIDWAR,RATING UPTO 63 AMP
	M/S INDIAN CURRENT CONTROL LTD	
	M/S LEGRAND (INDIA) PVT LTD	
	M/S SIEMENS LTD (CURRENT RATING: UPTO 63 A)	CURRENT RATING: UPTO 63 A,MANUFACTURING AT AURANGABAD
	M/S STANDARD ELECTRICALS LTD	MANUFACTURING LOCATION: HARIDWAR
	M/S SCHNEIDER ELECTRIC INDIA PVT LTD (RATING : UPTO 63 AMP)	RATING : UPTO 63 AMP
<b>63. MCCB</b>		

	M/S GE INDIA INDUSTRIAL PVT LTD	MANUFACTURING LOCATION BANGLORE
	M/S LARSEN & TOUBRO LTD	
	M/S SIEMENS LTD	MANUFACTURING AT KALWA MUMBAI
	M/S SCHNEIDER ELECTRIC INDIA PVT LTD	
	M/S BCH ELECTRIC LTD., NEW DELHI	
<b>64. MAGNETIC OIL LEVEL GAUGE</b>		
	M/S INSTRUMENT & CONTROLS	
	M/S SUKRUT UDYOG	
<b>65. OIL TEMPERATURE INDICATOR</b>		
	M/S PRECIMEASURE CONTROLS PVT LTD	
	M/S PERFECT CONTROLS	
<b>66. VACUUM INTERRUPTER</b>		
	M/S AREVA T & D INDIA LTD (T & D GROUP)	MNF. LOCATION : SALT LAKE KOLKATA,RATING UPTO 36 KV
	M/S ABB GLOBAL INDUTRIES & SERVICES LTD	RATING:UPTO 12 KV,3150 AMP,SC 40KA
	M/S CG POWER AND INDUSTRIAL SOLUTIONS LIMITED, MUMBAI	
<b>67. WINDING TEMPERATURE INDICATOR</b>		
	M/S PRECIMEASURE CONTROLS PVT LTD	
	M/S PERFECT CONTROL	
<b>68. CP SYSTEM</b>		
	M/S CORROSION TECHNOLOGY SERVICES INDIA (PVT) LTD	
	M/S CONSTRUCTION GUILD	
	M/S CORMIT ELECT PROJECTS PVT LTD,	
	M/S GOLCONDA CORROSION CONTROL (P) LTD.	
	M/S JSIW INFRASTRUCTURE PVT LTD	
	M/S RAYCHEM RPG (P) LTD	
	M/S BASICS TECHNO SERVICES PVT. LTD.	
	M/S CORRTECH INTERNATIONAL PVT. LTD., AHMEDABAD	
	M/s SARK EPC PROJECTS PVT. LTD., AHMEDABAD	
<b>69. CONTROL PANEL FLP</b>		
	M/S BALIGA LIGHTING EQUIPMENTS (P) LIMITED	
	M/S FLEXPLO ELECTRICAL PVT LTD	

	M/S FLAMPROOF EQUIPMENTS PVT LTD	FOR EOT CRANE APPLICATIONS
	M/S FCG POWER INDUSTRIES PVT LTD	
	M/S FCG FLAMPROOF CONTROL GEARS P LTD	WORKS DAMAN (KACHIGAM)
	M/S SUDHIR SWITCHGEARS PVT LTD	
<b>70. PUSH BUTTONS</b>		
	M/S BCH ELECTRIC LTD	
	M/S C & S ELECTRIC LTD	MANUFACTURED AT C-58 NOIDA PHASE II
	M/S ESSEN DEINK	
	M/S HOTLINE SWITCHGEAR & CONTROLS	
	M/S LARSEN & TOUBRO LTD - POWAI	
	M/S SIEMENS LIMITED	
	M/S SHRI TULSI SWITCHGEARS PVT LTD	
	M/S SCHNEIDER ELECTRIC INDIA PVT LTD	
	M/S TEKNIC CONTROLS	

## **PIPELINE**

<b>1</b>	<b>CS PIPES (EW, LSAW, HSAW &amp; SEAMLESS) AS PER API 5L FOR MAIN PIPE LINE.</b>	
	M/s	MAHARASHTRA SEAMLESS LTD.
	M/s	BHEL (TRICHY).
	M/s	INDIAN SEAMLESS METAL TUBES LTD.
	M/s	JINDAL PIPES LIMITED
	M/s	JINDAL SAW LTD.
	M/s	WELSPUN CORP LIMITED, MUMBAI (Excluding Seamless)
	M/s	SURYA ROSHNI LTD.
	M/s	RATNAMANI METALS AND TUBES LTD- For erw UPTO 16" UPTO 8.7 mm and upto X-65 grade
	M/s	MAN INDUSTRIES (I) LTD.
	M/s	NSC, JAPAN
	M/s	MITSUBISHI, JAPAN
	M/s	MGL, FRANCE
	M/s	SUMITOMO, JAPAN
	M/s	V &M, GERMANY
	M/s	NKK, JAPAN
	M/S	HYUNDAI PIPE CO. LTD (ENQ HYUNDAI CORPN)- For ERW Upto X65
	M/S	IPSCO INC -ERW Upto Grade X-65
	M/S	SEAH STEEL CORPORATION- For ERW Upto Grade-X-65
	M/S	TUBACERO S.A.-For ERW Upto Grade X-70
	M/S	TATA STEE UK -For ERW
	M/S	UMRAN STEEL PIPE INC -For ERW PIPES upto X-60
	M/s	TENARIS DALMINE,ITALY
	M/S	HUSTEEL CO. LTD -For ERW Upto X-65
	M/s	TAMSA, MEXICO
	M/s	MARUBENI, JAPAN
	M/s	ITOCHU, JAPAN
	M/s	KAWASAKI, JAPAN
	M/s	MANNESMANNROHREN WERKE , GERMANY
	M/s	THYSSEN, GERMANY
	M/s	EUROPIPE, FRANCE
	M/s	ILVA, ITALY
	M/s	mitsui
	M/s	MITTAL STEEL ROMA S.A. , ROMANIA
	M/s	EEW GMBH & CO., GERMANY
	M/s	North China Petroleum Steel Pipe Co. Ltd (Coated Line Pipe)

	M/s	JINDAL INDIA LIMITED - For ERW Line Pipe 6" to 18" up to Grade X70
Note: Line pipe shall be sourced from mills/ manufacturing plants appearing in the above list.		
<b>2</b>	<b>PIPELINE VALVES AS PER API 6D &amp; FIRE SAFE AS PER API 6FA. (FULL &amp; REDUCED BORE BALL VALVES)</b>	
	M/s	L&T Valves Ltd. India
	M/s	VIRGO ENGINEERS LTD., PUNE.
	M/s	FISHER XOMOX SANMAR LTD.
	M/s	PETROL VALVES, ITALY
	M/s	GROOVE ITALIA SPA, ITALY.
	M/s	AUTOMECH ENGINEERS PVT. LTD.,MUMBAI
	M/s	AV VALVES LTD.
	M/s	PERAR SPA, ITALY.
	M/s	STEEL STRONG VALVES (I) PVT. LTD., MUMBAI.
	M/s	COOPER CAMERON, SINGAPORE.
	M/s	KMC CORPORATION, KOREA.
	M/S	MICROFINISH VALVES PVT LIMITED- Size UPTO 30" UPTO 600# & 2"-16" 900# 2 PIECE CONSTRUCTION CAST STEEL BODY WITH SS BALL WITH DOUBLE BLOCK AND BLEED FEATURE
	M/S	OSWAL INDUSTRIES LTD- CS 150-600# , BOLTED -PRIMARY METAL SECONDARY SOFT SEATED.
	M/S	FRANZ SCHUCK GMBH (FORMERLY BORSIG O B 506 )
	M/S	KITAMURA VALVE MANUFACTURING CO . LTD
	M/S	MSA A. S.- SIZE UPTO 48" 600# , SIZE UPTO 36" UPTO 900#
	M/S	OMS SALERI
	M/S	VALBART SRL -SIZE UPTO 30" UPTO 900# , 32"-48" UPTO 600#
	M/S	PIBIVIESSEE S P A- SIZE UPTO 48"
	M/S	PCC BALL VALVES SRL-SIZE 2"-20" , RATING 150#-900# , SIZE 2"-8" NB RATING 1500#
	M/s	Anand Teknow Aids Engineering India Ltd (up to #600 only)
	M/s	PHBB VALVES PVT LTD, PUNE - FULL BORE BALL VALVE - FULLY WELDED TRUNNION TYPE, SIZE: UP TO 300 mm N.D. & UP TO 1500 CLASS
<b>3</b>	<b>COALTAR ENAMEL &amp; SYNTHETIC PRIMER</b>	
	M/s	RAIPUR TAR PRODUCTS, RAIPUR.
	M/s	PORWAL TAR PRODUCTS (P) LTD. , RAIPUR.
	M/s	LLOYD INSULATION (INDIA) LTD.
	M/s	EASTERN COATINGS AND SERVICES (P) LTD.
	M/s	SHALIMAR TAR PRODUCTS.
<b>4</b>	<b>FIBRE GLASS INNER WRAP</b>	

	M/s	UP TWIGA FIBRE GLASS LTD.,N.DELHI.
<b>5</b>	<b>COALTAR IMPREGNATED GLASS FIBRE OUTER WRAP(AWWA C-203)</b>	
	M/s	TIKI TAR INDUSTRIES, VADODARA.
	M/s	LLOYD BITUMEN PRODUCTS.
	M/s	A. R. LAMINATOR, VADODARA.
<b>6</b>	<b>3 LAYER POLYETHYLENE COATING</b>	
	M/s	PSL,
	M/s	WELSPUN CORP LIMITED, MUMBAI
	M/s	MAN INDUSTRIES, NEW DELHI.
	M/S	ESSAR STEEL LTD
	M/S	JINDAL SAW LTD
	M/S	JINDALINDIA LTD
	M/S	MAHARASTRA SEAMLESS LTD
	M/S	PRATIBHA INDUSTRIES LTD
	M/S	RATNAMANI METALS AND TUBES LTD
	M/S	AL-QAHTANI PIPE COATING TERMINAL
	M/S	SYNION PIPES AND COATINGS PVT LTD
<b>7</b>	<b>SHRINK SLEEVES</b>	
	M/s	SEAL FOR LIFE INDIA PVT LTD, VADODARA
	M/s	CANUSA-CPS, CANADA
	M/s	RAYCHEM RPG PVT LTD, JANAKPURI, NEW DELHI-110058(FOR ONE YEAR ONLY)
<b>8</b>	<b>CONCRETE COATING</b>	
	M/s	WELSPUN CORP LIMITED, MUMBAI
	M/s	PSL, INDIA.
	M/s	JINDAL SAW LTD.
<b>9</b>	<b>MONOLITHIC ISOLATION JOINT</b>	
	M/s	ALFA ENGINEERING, ITALY
	M/s	IJAS EQUIPMENT PTE.LTD. SINGAPORE.
	M/s	ZICOM EQUIPMENT PTE.LTD., SINGAPORE.
	M/s	PROC HIND INTERNATIONAL
	M/s	ZUNT ITALIA, ITALY.
	M/s	VEE KAY VIKRAM & CO. LLP, AHMEDABAD ( up to # 600 class )
	M/S	ADVANCE ELECTRONICS SYSTEMS-UPTO 18" UPTO 600#
	M/S	IGP ENGINEERS PVT LTD
	M/S	NUOVA GIUNGAS S.R.L.
<b>10</b>	<b>PIG INDICATOR</b>	



	M/s	PIPELINES ENGINEERING SUPPLY, UK
	M/S	FORAIN S.R.L.
	M/S	GD ENGINEERING
	M/S	BGR ENERGY SYSTEMS LTD, TAMIL NADU
	M/S	VEE KAY VIKRAM & CO. LLP, AHMEDABAD
<b>11</b>	<b>SCRAPPER TEES</b>	
	M/s	T D WILLIAMSON, USA
	M/s	PIPELINES ENGINEERING SUPPLY, UK
	M/s	SCHULZ EXPORT GMBH, GERMANY
	M/s	MULTITEX FILTRATION ENGINEERS LTD. , INDIA
	M/s	BGR ENERGY SYSTEMS LTD, TAMIL NADU
	M/s	SAWAN ENGINEERS PVT LTD
	M/s	TUBE PRODUCTS INCORPORATE-SIZE UPTO 24 X 24" & THK UPTO 14.3 MM
	M/s	VALVITALIA SPA-TECHNFORGE DIVISION -SIZE UPTO 24"
	M/s	VEE KAY VIKRAM & CO. LLP, AHMEDABAD
	M/s	UDKAM PROCESS EQUIPMENT INDIA PVT LTD., GREATER NOIDA
<b>12</b>	<b>HINGED CLOSURES</b>	
	M/s	PERRY EQUIPMENT CORPORATION, USA
	M/s	T D WILLIAMSON, USA
	M/s	PIPELINE ENGINEERING SUPPLY, UK
	M/s	VEEKAY VIKRAM & COMPANY PVT. LTD., AHMEDABAD (CS (NON-NACE)
	M/s	MULTITEX FILTRATION ENGINEERS LTD. , INDIA
	M/S	FORAIN S.R.L.
	M/S	GD ENGINEERING
	M/S	PECO FACET
	M/S	FULGOSI SRL
	M/S	BGR Energy Systems Ltd, Tamil Nadu
<b>13</b>	<b>LAUNCHER / RECEIVER ASSEMBLY (ASME-B31.4/31.8) -(ASME Sec VIII Div1)</b>	
	M/s	T D WILLIAMSON, USA
	M/s	PIPELINE ENGINEERING & SUPPLY CO. UK
	M/s	L&T, INDIA
	M/s	FAI OFFICINE DI CARVICO S.P.A., ITALY (CS-NACE & CS-NON NACE)
	M/s	VEEKAY VIKRAM & COMPANY PVT. LTD., AHMEDABAD (CS NON-NACE )
	M/s	VEEKAY VIKRAM & COMPANY PVT. LTD., AHMEDABAD (NACE)
	M/s	MULTITEX FILTRATION ENGINEERS LTD. , INDIA
	M/S	CONTROL PLUS OIL & GAS SOLUTIONS PRIVATE


	M/S	FORAIN S.R.L.
	M/S	FULGOSI SRL-SIZE UPTO 18" X 12" RATING UPTO 600#
	M/S	SIMA & TECTUBI SPA
	M/S	BGR ENERGY SYSTEMS LTD, TAMIL NADU
	M/S	INDCON PROJECTS & EQUIPMENT LTD, NEW DELHI
	M/s	OSWAL INFRASTRUCTURE LIMITED, GANDHI NAGAR ( GUJARAT): FOR PIG LAUNCHERS & RECEIVERS SIZE UPTO 30"ND 600 CLASS WITH SUPPLY OF QOEC AS BOUGHT OUT ITEM FROM CLIENT APPROVED VENDORS.
<b>14</b>	<b>CORROSION PROBES</b>	
	M/s	COSASCO DIVISION, USA
	M/s	REHRBACK COSASCO, USA
	M/s	Mc MURRAY, USA
	M/s	CAPROCO, CANADA
	M/s	ATEL, ITALY
	M/s	EMERSON PROCESS MANAGEMENT S.R.L.
<b>15</b>	<b>5D BENDS</b>	
	M/s	FABRICOM GTI, BELGIUM
	M/s	JINDAL SAW LTD.
	M/s	SUNGJIN, KOREA
	M/s	IGAWARA, SINGAPORE
	M/s	PSL, KANDLA.
	M/s	PROCLAD INDUCTION BENDING, U.K.
	M/s	TENARIS DALMINE,ITALY
	M/s	DAI-ICHI,JAPAN
	M/s	PIPELINE ENGINEERING, UK
	M/s	WELSPUN CORP LIMITED, MUMBAI
<b>16</b>	<b>HDPE LINE PIPES &amp; FITTINGS</b>	
	M/s	SANGIR PLASTICS PVT. LTD., MUMBAI
	M/s	JAIN IRRIGATION SYSTEMS LTD.


**CIVIL**

1	Ceramic tiles for building flooring I skirting I dado	H&R JoHnson Ltd.I SomanyI Pilkington Ltd. I Kajaria I Bell Ceramic I SPARTEK
2	Ceramic I glazed tiles for toilet flooring I dado	H&R JoHnson Ltd.I SomanyI Pilkington Ltd. I Kajaria I Bell Ceramic I SPARTEK I NITCO I REGENCY
3	Antistatic PVC flooring I TILES	ROYAL I ARMSTRONG I KRISHNA I Wonder floorI Poly floor
4	Kerbing I Pre-finished Cement Tiles	EUROCON I ULTRA
5	Distemper I ACRYLIC EMULSION Paint I Primer	ICI I BERGERI NEROLACI JENSON & NIICHOLSANI British Paints I Asian Paints (Butterfly I Apcolite)I SHALIMAR I NE PAINT UDYOG, NE Paint Udyog Ltd.
6	Waterproofing cement paint	Snowcem I Indocem I DURACEMI SUPREMEI SURFACEM
7	CI Rain water I Soil pipes and CI accessories	NECO or ISI marked as approved by the Engineer-in-Charge
8	MS Pipe I G.I. Pipe	ZENITHI TATAI Jindal I GST
9	M.S. I G.I. Fittings	TATA I 'R' BRAND
10	Pre-laminatedIPlain particle boards	Bhutan boards I Ecoboard I Novapen
11	GlazingI Glass	INDO-ASAHII Hindustan Pilkington.I Triveni IAtul I Modi FLOAT I SAINT GOBAIN
12	BWP Ply I PlywoodI Common plyI Flush door	NATIONAL I CorebetI Green ply I Kit ply
13	Sanitary ware (Water closetI wash basinIurinalI flushing CisternI WC cover etc.)	Hindustan I PARYWARE I NEYCERI Cera
14	C.P. brass fittings	ARK-SOMAI NOVA-SPECTRUMI METRO- SUPERI PARKOI ESSCO
15	Flush Valve	ARK-SOMAI NOVA-SPECTRUMI METRO- SUPERI PARKOI ESSCO
16	Bib cock I Stop Cock	ARK-SOMAI NOVA-SPECTRUMI METRO- SUPERI PARKOI ESSCO
17	Wheel valveI gate valve (brass)	ORIENT I leader
18	Brass float valve with Copper floats	ORIENT I leader


19	Floor Traps I Nahani Traps	I.S. APPROVED
20	Mirror	Modi I Atul
21	PVC Pipe	SupremeI Finolex I PRINCEI HYCOUNT
22	PVC Pipe Fittings	SupremeI PRINCEI STAR
23	A.C. Sheets	EverestI LotusI Charminar
24	P.V.C. Tanks	SintexI RenoI INFRAI FUSSIONI UNIPLASI PATTON
25	Hydraulic Door closer	Prabhat I Hadwyn I Godrej
26	Aluminum section	INDALI IJindal
27	Locks	GODREJ I HARRISON
28	Anodized aluminium hardware fittings	SHALIMAR IGARNISH or ISI Marked.
29	Water proofing Compound	FOSROCI ROFFI SIKA MULTIPLASI Acco proof.
30	Floor Hardener	IRONITEI HARDONITEI FERROKE
31	P.V.C handrail	FixopanI Caliplast
32	Rigid PVC Conduit Medium Gauge wall thickness ISI & FIA approved & manufactured from virgin material. PrecisionI AKG	Medium Gauge wall thickness ISI & FIA approved & manufactured from virgin material. Precision
33	Accessories for conduit	Same make as of pipe
34	Flexible Copper Wires	R.R. KableI HavellsI FINOLEX
35	Switches	LK ( Denish Range )IMDS I ANCHORI LEGRAND
36	Telephone wiresI CAT 6 wire	RR KableI DeltonI AT&T as per ITD SIWS-II3 B.
37	PVC tape	Steel gripl Anchor
38	Switch Plate	Decolam Hylam sheet 3.0 mm thick. OR Sintex SMC sheets
39	Button holderI Angle olderI Ceiling rose	AnchorI CPL
40	M.S. Conduit ISI	BECI Steel CraftI AKG.(14GUAGE)
41	Ceiling Fans, Exhaust Fan	CromptonI OrientI UshaI BajajI AlmonardI ClipsallI KHAITAN
42	Steel Doors & Windows	SEN HARVICI AGEW I SENTIANALI HOPES METALI MULTIWYNI NCL SECCOLOR LTD.


43	Aluminum Doors, Windows & Wall spans	AJIT INDIA I ALUMILITE I INDALI JINDALI JUPITER WINDOWS
44	PA System I Amplifier	Mega I Shure I Philips
45	Speaker I Mic	Mega I Shure I Philips
46	EPABX I Telephone instrument	Seimens I TATA I ITI I BPL I MATRIX I BETEL
47	Air-conditioners	Samsung I LG I Carrier I Voltas I Electolux I BLUE STAR I GE I NATIONAL I HITACHI
48	Television	Sony I Samsung I LG I PHILIPS I VIDEOCON
49	DVD Player	Sony I Samsung I LG I PHILIPS I VIDEOCON
50	Water Cooler	VOLTAS I USHA I CARRIER I BLUE STAR
51	R.O. Plant	EUREKA FORBES
52	Furniture (Modular)	GODREJ I FEATHERLIGHT
53	P.C.	IBM I HPI I HCL I COMPAQ
54	Printer	HPI I SAMSUNG I EPSON
55	TMT Bars	Steel Authority of India Limited (SAIL) I Rashtriya Ispat Nigam Limited (RINL) I Tata Iron & Steel Company (TISCO) I Essar Steel (ESSAR) I Jindal Steel & Power Limited (JINDAL) I Shyam Steel Industries, Kolkata I SRMB Udyog Limited, Kolkata I Usha Martin, Ranchi I Jamshedpur I Rathi Udyog Ltd, Ghaziabad
56	Structural Steel (Including plates)	Steel Authority of India Limited (SAIL) I Rashtriya Ispat Nigam Limited (RINL) I Tata Iron & Steel Company (TISCO) I Essar Steel (ESSAR) I Jindal Steel & Power Limited (JINDAL)
57	Cement	Associated Cement Companies Limited (ACC Cement) I Ultratech Cement Limited (L&T Cement I Aditya Birla Cement I Ultratech) I Gujarat Ambuja Cements Limited (Gujarat Ambuja Cement) I Shree Cement limited (Shree Ultra Cement I Bangur Cement) I Lafarge Cement India Limited (Lafarge Cement) I Cement Corporation of India Limited (CCI Cement) I Jaypee Cement Limited (Jaypee Cement) I JK Lakshmi Cement Limited (JK Lakshmi Cement) I Madras Cement Limited (Ramco Cement) <b>AND</b> The registered Cement companies enlisted at INAM Pro the portal of Ministry of Road Transport & Highways, Govt. of India (www.inampro.nic.in)


		<b>PIPING MATERIAL SPECIFICATION</b> <b>A1A</b>			
<b>DOC. NO.</b> : 1019-PI-PMS-101		<b>CLIENT</b> : SUN PETROCHEMICALS PVT LTD, KHAMBHAT		<b>REV</b> : 1	
<b>PROJECT NO.</b> : 1019		<b>PROJECT</b> : BHASKAR FIELD			
<p><b>PROJECT: CENTRAL PROCESSING FACILITY AUGMENTATION</b></p> <p><b>DOCUMENT: PIPING MATERIAL SPECIFICATION</b></p>					
1	03.02.2020	ISSUED FOR ENGINEERING	RZ	RZ	BP
0	06.06.2019	ISSUED FOR REVIEW	IJ	RZ	BP
<b>REV</b>	<b>DATE</b>	<b>DESCRIPTION</b>	<b>PREPARED BY</b>	<b>CHECKED BY</b>	<b>APPROVED BY</b>


		<b>PIPING MATERIAL SPECIFICATION</b> <b>A1A</b>			
DOC. NO. : 1019-PI-PMS-101		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT		SHEET : 1 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD		REV 1	
<p><b>PIPING MATERIAL SPECIFICATION</b></p> <p><b>FOR CLASS A1A</b></p>					
1	03.02.2020	ISSUED FOR ENGINEERING	RZ	RZ	BP
0	06.06.2019	ISSUED FOR REVIEW	IJ	RZ	BP
REV	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY





		PIPING MATERIAL SPECIFICATION A1A											
DOC. NO. : 1019-PI-PMS-101		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT										SHEET : 2 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD										REV 1	
ASME CLASS	CORROSION ALLOWANCE	TEMPERATURE	°C	-29	38	50	100						PIPE CLASS:
150#	1.5 mm	PRESSURE	kg/cm <sup>2</sup> g	19.98	19.98	19.57	18.04						A1A
SERVICE:		DRAIN											
BASIC MATERIAL :		CARBON STEEL											
<b>NOTES:</b> <ol style="list-style-type: none"> <li>1) BUTT WELDED JOINT- 100% VISUAL, 10% RADIOGRAPHY.</li> <li>2) BRANCH CONNECTION- 100% VISUAL; DYE PENETRANT TEST-100% (FOR ROOT RUN/FINAL RUN)</li> <li>3) VENT &amp; DRAIN SHALL HAVE FLANGED ENDS.</li> <li>4) TYPE OF STRAINERS ARE TENTATIVE, SELECTION OF STRAINER WILL BE AS PER P&amp;ID.</li> </ol>													
ITEM	SIZE	DESCRIPTION											
MAINTENANCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM											
PIPE JOINTS	40 NB & BELOW	SW											
	50 NB & ABOVE	BUTTWELDED											
DRAIN (HYDRO)	ALL	25 NB											
VENT (HYDRO)	ALL	15 NB											
TEMP. CONN.	40 NB OR AS PER P&ID	FLANGED											
PRESS. CONN.	25 NB OR AS PER P&ID	SPEC AS PER P&ID											

		PIPING MATERIAL SPECIFICATION A1A							
DOC. NO. : 1019-PI-PMS-101		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 3 OF 5	
PROJECT NO. : 1019		PROJECT : BHASKAR FIELD						REV : 1	
ASME CLASS	CORROSION ALLOWANCE	BRANCH TABLE						PIPE CLASS:	
150#	1.5 mm							A1A	
T	TEES BW (EQ. OR RED.)								
TS	TEES SW (EQ. OR RED.)								
H	HALF COUPLING (SW)								
W	WELDOLET								



			PIPING MATERIAL SPECIFICATION A1A								
DOC. NO. : 1019-PI-PMS-101			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 4 OF 5		
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 1		
ASME CLASS		CORROSION ALLOWANCE								PIPE CLASS:	
150#		1.5 mm								A1A	
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS		
			LOW	HIGH				DESCRIPTION			
PIPE	PIPE	PE	15	40	SCH. 80	-	ASME B36.10	ASTM A 106 GR. B			
	PIPE	BE	50	150	SCH. 40	-	ASME B36.10	ASTM A 106 GR. B			
	NIPPLE	PBE/PE-NPT	15	40	SCH. 80	-	ASME B36.10	ASTM A 106 GR. B			
FLANGES	SOCKET WELD	RF	15	40	150#/ SCH. 80	125-250 μAARH	ASME B16.5	ASTM A 105			
	WELD NECK	RF	50	150	150#/SCH.40	125-250 μAARH	ASME B16.5	ASTM A 105			
	BLIND	RF	15	150	150#	125-250 μAARH	ASME B16.5	ASTM A 105			
	SPECTACLE BLIND	FF	15	150	150#	125-250 μAARH	ASME B16.48	ASTM A 105			
FITTINGS	ELBOW 90°/45°	SW	15	40	3000#	-	ASME B16.11	ASTM A 105			
	ELBOW 90°/45°	BW	50	150	SCH. 40	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S			
	EQUAL/RED. TEE	SW	15	40	3000#	-	ASME B16.11	ASTM A 105			
	EQUAL/RED. TEE	BW	50	150	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S			
	CONC./ECC RED.	BW	50	150	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S			
	CONC./ECC. SWG.	PBE	15	80	3000#	-	BS 3799	ASTM A 105			
	CAP	SW	15	40	3000#	-	ASME B16.11	ASTM A 105			
	CAP	BW	50	150	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S			
	FULL COUPLING	SW	15	40	3000#	-	ASME B16.11	ASTM A 105			
	FULL COUPLING	THD.	15	40	3000#	-	ASME B16.11	ASTM A 105			
	HALF COUPLING	SW	15	40	3000#	-	ASME B16.11	ASTM A 105			
VALVES	BALL VALVE (RED. BORE)	RF/ B16.5	15	150	150#	125-250 μAARH	BS EN ISO 17292	BODY: ASTM A 216 GR. WCB, TRIM: SS304, SEAT: PTFE			
	CHECK VALVE (NON SLAM)	SAND CONN. B16.5	15	40	150#	125-250 μAARH	MNF. STD.	BODY: ASTM A 105, TRIM: 13% CR. STEEL			
	CHECK VALVE (SWING PLATE)	SAND CONN. B16.5	50	150	150#	125-250 μAARH	API 594	BODY: ASTM A 216 GR. WCB, TRIM: 13% CR. STEEL			

			PIPING MATERIAL SPECIFICATION A1A						
DOC. NO. : 1019-PI-PMS-101			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT					SHEET : 5 OF 5	
PROJECT NO. 1019			PROJECT : BHASKAR FIELD					REV 1	
ASME CLASS		CORROSION ALLOWANCE						PIPE CLASS:	
150#		1.5 mm						A1A	
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
GASKET/BOL	STUD BOLT	-	15	150	-	-	ASME B18.2.1 ASME B18.2.2	BOLT : ASTM A 193 GR. B7 NUT : ASTM A 194 GR. 2H	
	GASKET	-	15	150	4.5 mm/ 150#	-	ASME B16.20 ASME B16.5	SPIRAL WOUND PTFE FILLER, SS304 INNER RING / CS OUTER RING	
STRAINERS	Y-TYPE STRAINER	RF/ B16.5	15	80	150#	125-250 µAARH	MNF. STD	BODY: ASTM A 216 GR. WCB, TRIM: 13% CR. STEEL	
	BASKET TYPE STRAINER	RF/ B16.5	100	150	150#	125-250 µAARH	MNF. STD	BODY: ASTM A 216 GR. WCB, TRIM: 13% CR. STEEL	




		PIPING MATERIAL SPECIFICATION A1L					
DOC. NO. :1019-PI-PMS-102		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT			SHEET : 1 OF 5		
PROJECT NO. 1019		PROJECT : BHASKAR FIELD			REV 1		
<div>PIPING MATERIAL SPECIFICATION FOR CLASS A1L</div>							
1	03.02.2020	ISSUED FOR ENGINEERING			RZ	RZ	BP
0	06.06.2019	ISSUED FOR REVIEW			IJ	RZ	BP
REV	DATE	DESCRIPTION			PREPARED BY	CHECKED BY	APPROVED BY


		PIPING MATERIAL SPECIFICATION A1L											
DOC. NO. :1019-PI-PMS-102		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT										SHEET : 2 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD										REV 1	
ASME CLASS	CORROSION ALLOWANCE	TEMPERATURE	°C	-29	38	50	100						PIPE CLASS:
150#	NIL	PRESSURE	kg/cm <sup>2</sup> g	19.4	19.4	18.76	16.51						A1L
SERVICE:		DOSING CHEMICALS 1											
BASIC MATERIAL :		SS316											
<b>NOTES:</b> <ol style="list-style-type: none"> <li>1) BUTT WEIDED JOINT -100% VISUAL CHECKING, 10% RADIOGRAPHY FOR DOSING CHEMICALS 1</li> <li>2) BRANCH CONNECTION -100% VISUAL, DYE PENETRANT TEST-10%</li> <li>3) TYPE OF STRAINER ARE TENTATIVE, SELECTION OF STRAINER WILL BE AS PER P&amp;ID.</li> <li>4) ADDITIONAL TAPPINGS WITH BLIND FLANGES SHALL BE PROVIDED AT SUITABLE LOCATIONS ON ALL HEADERS AT ALL FLOOR ELEVATIONS FOR FUTURE USE.</li> </ol>													
ITEM	SIZE	DESCRIPTION											
MAINTENANCE JOINTS	ALL	FLANGED, TO BE KEPT JUST SUFFICIENT FOR MAINTENANCE											
PIPE JOINTS	ALL	BUTTWELDED											
DRAIN (HYDRO)	ALL	25 NB											
VENT (HYDRO)	ALL	15 NB											
TEMP. CONN.	40 NB OR AS PER P&ID	FLANGED											
PRESS. CONN.	25 NB OR AS PER P&ID	SPEC AS PER P&ID											




			PIPING MATERIAL SPECIFICATION A1L								
DOC. NO. :1019-PI-PMS-102			CLIENT :SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 4 OF 5		
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 1		
ASME CLASS		CORROSION ALLOWANCE								PIPE CLASS:	
150#		NIL								A1L	
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS		
			LOW	HIGH				DESCRIPTION			
PIPE	PIPE	BE	15	40	SCH. 40S	-	ASME B36.19	ASTM A 312 TP316, SEAMLESS			
	PIPE	BE	50	50	SCH. 40S	-	ASME B36.19	ASTM A 312 TP316, SEAMLESS			
	PIPE	BE	80	300	SCH. 10S	-	ASME B36.19	ASTM A 312 TP316, SEAMLESS			
	NIPPLE	PE/ PE-NPT	15	40	SCH. 80S	-	ASME B36.19	ASTM A 312 TP316, SEAMLESS			
FLANGES	LAP JOINT	RF	15	300	150#	125-250 μAARH	ASME B16.5	IS 2062 GR. B (WITH PROTECTIVE COATING)			
	BLIND	RF	15	300	150#	125-250 μAARH	ASME B16.5	IS 2062 GR. B, 3 mm THK. SS304 CLADDED			
	SPECTACLE BLIND	FF	15	300	150#	125-250 μAARH	ASME B16.48	IS 2062 GR. B, 3 mm THK. SS304 CLADDED			
STUB ENDS	SHORT PATTERN	BW	15	50	SCH. 40S	-	ASME B16.9	ASTM A 403 GR. WP316-S			
	SHORT PATTERN	BW	80	300	SCH. 10S	-	ASME B16.9	ASTM A 403 GR. WP316-S			
FITTINGS	ELBOW 90°/45°	BW	15	50	SCH. 40S	R = 1.5D	ASME B16.9	ASTM A 403 GR. WP316-S			
	ELBOW 90°/45°	BW	80	300	SCH. 10S	R = 1.5D	ASME B16.9	ASTM A 403 GR. WP316-S			
	EQUAL/RED. TEE	BW	15	50	SCH. 40S	-	ASME B16.9	ASTM A 403 GR. WP316-S			
	EQUAL/RED. TEE	BW	80	300	SCH. 10S	-	ASME B16.9	ASTM A 403 GR. WP316-S			
	CONC./ECC RED.	BW	15	50	SCH. 40S	-	ASME B16.9	ASTM A 403 GR. WP316-S			
	CONC./ECC RED.	BW	80	300	SCH. 10S	-	ASME B16.9	ASTM A 403 GR. WP316-S			
	SOCKOLET	SW	50	100	TSAP*	-	MSS SP 97	ASTM A 182 GR. F316			
	HALF COUPLING	SW	15	40	3000#	-	ASME B16.11	ASTM A 182 GR. F316			
	FULL COUPLING	SW	15	40	3000#	-	ASME B16.11	ASTM A 182 GR. F316			
	FULL COUPLING	NPT	15	40	3000#	-	ASME B16.11	ASTM A 182 GR. F316			
	CAP	BW	15	50	SCH. 40S	-	ASME B16.9	ASTM A 403 GR. WP316-S			
CAP	BW	80	300	SCH. 10S	-	ASME B16.9	ASTM A 403 GR. WP316-S				
VALVES	BALL VALVE (REDUCE BORE)	RF/ B16.5	15	300	150#	125-250 μAARH	BS EN ISO 17292	BODY: ASTM A 351 GR. CF8M, TRIM: SS316, STEAM -SS316			
	BUTTERFLY VALVE	SAND CONN. B16.5	150	300	150#	125-250 μAARH	API 609	BODY: ASTM A 351 GR. CF8M, TRIM & SPINDLE: SS316, SEAT: PTFE			
*THICKNESS SAME AS PIPE											





			PIPING MATERIAL SPECIFICATION A1L						
DOC. NO. :1019-PI-PMS-102			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 5 OF 5
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 1
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:
150#		NIL							A1L
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
VALVES	CHECK VALVE (LIFT TYPE)	SAND CONN. B16.5	15	40	150#	125-250 µAARH	MNF. STD.	BODY: ASTM A 182 GR. F316, TRIM: SS316	
	CHECK VALVE (SWING TYPE)	SAND CONN. B16.5	50	300	150#	125-250 µAARH	API 594	BODY: ASTM A 351 GR. CF8M, TRIM: SS316	
GASKET/BOL	STUD BOLT	-	15	300	-	-	ASME B18.2.1 ASME B18.2.2	BOLT : A193 GR. B7, NUT : A194 GR. 2H	
	GASKET	-	15	300	3 mm/ 150#	-	ASME B16.21 ASME B16.5	SPIRAL WOUND PTFE FILL,SS316 INNER RING /C.S OUTER RINGS	
STRAINERS	Y-TYPE STRAINER	RF/ B16.5	15	80	150#	125-250 µAARH	MNF. STD	BODY: ASTM A 351 GR. CF8M, INT.: SS316	
	BASKET TYPE STRAINER	RF/ B16.5	100	450	150#	125-250 µAARH	MNF. STD	BODY: ASTM A 351 GR. CF8M, INT.: SS316	


		<b>PIPING MATERIAL SPECIFICATION</b> <b>A2F</b>			
DOC. NO. : 1019-PI-PMS-103		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT		SHEET : 1 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD		REV 0	
<b>PIPING MATERIAL SPECIFICATION</b> <b>FOR CLASS A2F</b>					
0	06.06.2019	ISSUED FOR REVIEW	IJ	RZ	BP
REV	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY



		PIPING MATERIAL SPECIFICATION A2F											
DOC. NO. : 1019-PI-PMS-103		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT										SHEET : 2 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD										REV 0	
ASME CLASS	CORROSION ALLOWANCE	TEMPERATURE	°C	-29	38	50	100						PIPE CLASS:
150#	NIL	PRESSURE	kg/cm <sup>2</sup> g	19.98	19.98	19.57	18.04						A2F
SERVICE:		INSTRUMENTAIR											
BASIC MATERIAL:		CARBON STEEL, GALVANIZED											
<b>NOTES:</b> <ol style="list-style-type: none"> <li>1) SURFACES WHERE GALVANISING HAS BEEN BURNT OFF SHALL BE WIRE BRUSHED AND COLD GALVANISED WITH ZINC COATING COMPOUND.</li> <li>2) WELDED JOINTS SHALL BE TESTED TO 100% VISUAL AND 10% DPT.</li> <li>3) ADDITIONAL TAPPINGS WITH BLIND FLANGES SHALL BE PROVIDED AT SUITABLE LOCATIONS ON ALL HEADERS AT ALL FLOOR ELEVATIONS FOR FUTURE USE.</li> </ol>													
ITEM	SIZE	DESCRIPTION											
MAINTENANCE JOINTS	ALL	FLANGED, TO BE KEPT JUST SUFFICIENT FOR MAINTENANCE											
PIPE JOINTS	40 NB & BELOW	SW											
	50 NB & ABOVE	BUTTWELDED											
DRAIN (HYDRO)	ALL	25 NB											
VENT (HYDRO)	ALL	15 NB											
TEMP. CONN.	40 NB OR AS PER P&ID	FLANGED											
PRESS. CONN.	25 NB OR AS PER P&ID	AS PER P & ID											




			PIPING MATERIAL SPECIFICATION A2F						
DOC. NO. : 1019-PI-PMS-103			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 4 OF 5
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 0
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:
150#		NIL							A2F
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
PIPE	PIPE	PE	15	40	HVY.	-	IS 1239-1	IS 1239-1, ERW (HOT DIPPED GALVANIZED)	
	PIPE	BE	50	150	HVY.	-	IS 1239-1	IS 1239-1, ERW (HOT DIPPED GALVANIZED)	
FLANGES	SOCKET WELD	RF	15	40	150#	125-250 µAARH	ASME B16.5	ASTM A 105, GALV.	
	SLIP ON	RF	50	150	150#	125-250 µAARH	ASME B16.5	IS 2062 GR. B, GALV.	
	BLIND FLANGE	RF	15	150	150#	125-250 µAARH	ASME B16.5	IS 2062 GR. B, GALV.	
	SPECTACLE BLIND	FF	15	150	150#	125-250 µAARH	ASME B16.48	IS 2062 GR. B, GALV.	
FITTINGS	ELBOW 90°/45°	SW	15	40	3000#	-	ASME B16.11	ASTM A 105, GALV.	
	ELBOW 90°/45°	BW	50	150	SCH. 40	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S, GALV.	
	EQUAL/RED. TEE	SW	15	40	3000#	-	ASME B16.11	ASTM A 105, GALV.	
	EQUAL/RED. TEE	BW	50	150	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S, GALV.	
	CONC./ECC RED.	BW	50	150	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S, GALV.	
	CONC./ECC SWG.	PBE	15	80	3000#	-	BS 3799	ASTM A 105, GALV.	
	CAP	SW	15	40	3000#	-	ASME B16.11	ASTM A 105, GALV.	
	CAP	BW	50	150	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S, GALV.	
	FULL COUPLING	SW	15	40	3000#	-	ASME B16.11	ASTM A 105, GALV.	
	HALF COUPLING	SW	15	40	3000#	-	ASME B16.11	ASTM A 105, GALV.	
VALVES	BALL VALVE (FULL BORE)	RF/ B16.5	15	150	150#	125-250 µAARH	ISO 17292	BODY: ASTM A 216 GR. WCB, TRIM: SS304, SEAT: PTFE	
	CHECK VALVE (NON SLAM)	SAND CONN. B16.5	15	40	150#	125-250 µAARH	MNF. STD.	BODY: ASTM A 105, TRIM: 13% CR. STEEL	
	CHECK VALVE (DUAL PLATE)	SAND CONN. B16.5	50	150	150#	125-250 µAARH	API 594	BODY: ASTM A 216 GR. WCB, TRIM: 13% CR. STEEL	
	BUTTERFLY VALVE	SAND CONN. B16.5	50	150	150#	125-250 µAARH	API-609	BODY: ASTM A 216 GR. WCB, TRIM: 13% CR. STEEL, SEAT: PTFE	



			PIPING MATERIAL SPECIFICATION A2F						
DOC. NO. : 1019-PI-PMS-103			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 5 OF 5
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 0
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:
150#		NIL							A2F
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
GASKET/ BOLT	STUD BOLT	-	15	150	-	-	IS 1363	BOLT : IS 1367 CLASS 4.6 (G.I.) NUT : IS 1367 CLASS 4 (G.I.)	
	GASKET	-	15	150	2 mm/ 150#	-	ASME B16.21 ASME B16.5	CHAMPION STYLE AF 120	
STRAINER	Y-TYPE STRAINER	RF/ B16.5	15	50	150#	125-250 µAARH	MNF. STD	BODY: ASTM A 216 GR. WCB, TRIM: 13% CR. STEEL	
	BASKET TYPE STRAINER	RF/ B16.5	80	150	150#	125-250 µAARH	MNF. STD	BODY: ASTM A 216 GR. WCB, TRIM: 13% CR. STEEL	






		<b>PIPING MATERIAL SPECIFICATION</b> <b>A3A</b>			
<b>DOC. NO.</b> : 1019-PI-PMS-104		<b>CLIENT</b> : SUN PETROCHEMICALS PVT LTD, KHAMBHAT		<b>SHEET</b> : 1 OF 5	
<b>PROJECT NO.</b> 1019		<b>PROJECT</b> : BHASKAR FIELD		<b>REV</b> 0	
<b>PIPING MATERIAL SPECIFICATION FOR CLASS A3A</b>					
1	03.02.2020	ISSUED FOR ENGINEERING	RZ	RZ	BP
0	06.06.2019	ISSUED FOR REVIEW	IJ	RZ	BP
<b>REV</b>	<b>DATE</b>	<b>DESCRIPTION</b>	<b>PREPARED BY</b>	<b>CHECKED BY</b>	<b>APPROVED BY</b>


		PIPING MATERIAL SPECIFICATION A3A											
DOC. NO. : 1019-PI-PMS-104		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT										SHEET : 2 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD										REV 0	
ASME CLASS	CORROSION ALLOWANCE	TEMPERATURE	°C	-29	38	50	100	150					PIPE CLASS:
150#	1.6 mm	PRESSURE	kg/cm <sup>2</sup> g	19.98	19.98	19.57	18.04	16.11					A3A
SERVICE:		DIESEL,FULE GAS/BLANKETING GAS, HOT OIL SUPPLY, HOT OIL RETURN, SERVO GAS 											
BASIC MATERIAL :		CARBON STEEL											
NOTES: 1) BUTT WELDED JOINT- 100% VISUAL, 10% RADIOGRAPHY 2) BRANCH CONNECTION- 100% VISUAL; DYE PENETRANT TEST-10% (FOR ROOT RUN/FINAL RUN) 3) VENT & DRAIN SHALL HAVE FLANGED ENDS. 4) TYPE OF STRAINERS ARE TENTATIVE, SELECTION OF STRAINER WILL BE AS PER P&ID													
ITEM	SIZE	DESCRIPTION											
MAINTENANCE JOINTS	ALL	FLANGED, TO BE KEPT JUST SUFFICIENT FOR MAINTENANCE.											
PIPE JOINTS	40 NB & BELOW	SW											
	50 NB & ABOVE	BUTTWELDED											
DRAIN (HYDRO)	ALL	25 NB											
VENT (HYDRO)	ALL	15 NB											
TEMP. CONN.	40 NB OR AS PER P&ID	FLANGED											
PRESS. CONN.	25 NB OR AS PER P&ID	AS PER P&ID											




		PIPING MATERIAL SPECIFICATION A3A											
DOC. NO. : 1019-PI-PMS-104		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT										SHEET : 3 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD										REV 0	
ASME CLASS	CORROSION ALLOWANCE	BRANCH TABLE										PIPE CLASS:	
150#	1.6 mm											A3A	
T	TEES BW (EQ. OR RED.)												
TS	TEES SW (EQ. OR RED.)												
H	HALF COUPLING (SW)												
P	PIPE TO PIPE												
R	PIPE TO PIPE, REINFORCED												


			PIPING MATERIAL SPECIFICATION A3A						
DOC. NO. : 1019-PI-PMS-104			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 4 OF 5
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 0
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:
150#		1.6 mm							A3A
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
PIPE	PIPE	PE	15	40	SCH. 80	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)	
	PIPE	BE	50	150	SCH. 40	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)	
	PIPE	BE	200	300	SCH. 20	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)	
	NIPPLE	PBE/PE-NPT	15	40	SCH. 80		ASME B36.10	ASTM A 106 GR. B (SEAMLESS)	
FLANGES	SOCKET WELD	RF	15	40	150#/ SCH. 80	125-250 µAARH	ASME B16.5	ASTM A 105	
	SLIP ON	RF	50	300	150#	125-250 µAARH	ASME B16.5	ASTM A 105	
	BLIND	RF	15	300	150#	125-250 µAARH	ASME B16.5	ASTM A 105	
	SPECTACLE BLIND	FF	15	300	150#	125-250 µAARH	ASME B16.48	ASTM A 105	
FITTINGS	ELBOW 90°/45°	SW	15	40	3000#	-	ASME B16.11	ASTM A 105	
	ELBOW 90°/45°	BW	50	150	SCH. 40	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S	
	ELBOW 90°/45°	BW	200	300	SCH. 20	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S	
	EQUAL/RED. TEE	SW	15	40	3000#	-	ASME B16.11	ASTM A 105	
	EQUAL/RED. TEE	BW	50	150	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S	
	EQUAL/RED. TEE	BW	200	300	SCH. 20	-	ASME B16.9	ASTM A 234 GR. WPB-S	
	CONC./ECC RED.	BW	50	150	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S	
	CONC./ECC RED.	BW	200	300	SCH. 20	-	ASME B16.9	ASTM A 234 GR. WPB-S	
	CONC./ECC SWG.	PBE	15	80	3000#	-	BS 3799	ASTM A 105	
	CAP	SW	15	40	3000#	-	ASME B16.11	ASTM A 105	
	CAP	BW	50	150	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S	
	CAP	BW	200	300	SCH. 20	-	ASME B16.9	ASTM A 234 GR. WPB-S	
	FULL COUPLING	SW	15	40	3000#	-	ASME B16.11	ASTM A 105	
	FULL COUPLING	NPT	15	40	3000#	-	ASME B16.11	ASTM A 105	
	HALF COUPLING	SW	15	40	3000#	-	ASME B16.11	ASTM A 105	
VALVE S	BALL VALVE (REDUCE BORE)	RF/ B16.5	15	300	150#	125-250 µAARH	BS EN ISO 17292	BODY: ASTM A 216 GR. WCB, TRIM: SS304, SEAT: PTFE	


			PIPING MATERIAL SPECIFICATION A3A						
DOC. NO. : 1019-PI-PMS-104			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 5 OF 5
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 0
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:
150#		1.6 mm							A3A
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
VALVES	GLOBE VALVE	RF/ B16.5	50	100	150#	125-250 µAARH	BS 1873	BODY: ASTM A 216 GR. WCB, TRIM: 13% CR. STEEL	
	CHECK VALVE (LIFT TYPE)	SAND CONN. B16.5	15	40	150#	125-250 µAARH	MNF. STD.	BODY: ASTM A 105, TRIM: 13% CR. STEEL	
	CHECK VALVE (SWING DISC)	RF/ B16.5	50	300	150#	125-250 µAARH	API 594	BODY: ASTM A 216 GR. WCB, TRIM: 13% CR. STEEL	
	BUTTERFLY VALVE	SAND CONN. B16.5	80	300	150#	125-250 µAARH	API 609	BODY: ASTM A 216 GR WCB; TRIM & SPINDLE: 13% CR STEEL; SEAT: PTFE; DISC: PTFE LINED	
	GATE VALVE	SW,3000#/B16.11	15	40	800#	125-250 µAARH	API 602	BODY: ASTM A 105, TRIM: 13% CR. STEEL	
	GATE VALVE	RF/ B16.5	50	300	150#	125-250 µAARH	API 600	BODY: ASTM A 216 GR WCB; TRIM: 13% CR STEEL	
GASKET/BOL	STUD BOLT	-	15	300	-	-	ASME B18.2.1 ASME B18.2.2	BOLT : A193 GR. B7, NUT : A194 GR. 2H	
	GASKET	-	15	300	4.5 mm/ 150#	-	ASME B16.21 ASME B16.5	SPIRAL WOUND PTFE FILL, SS304 INNER RING / CS OUTER RINGS	
STRAINERS	Y-TYPE STRAINER	RF/ B16.5	15	80	150#	125-250 µAARH	MNF. STD	BODY: ASTM A 216 GR. WCB, TRIM: 13% CR. STEEL	
	BASKET TYPE STRAINER	RF/ B16.5	100	300	150#	125-250 µAARH	MNF. STD	BODY: ASTM A 216 GR. WCB, TRIM: 13% CR. STEEL	

		<b>PIPING MATERIAL SPECIFICATION</b> <b>A6J</b>			
DOC. NO. : 1019-PI-PMS-105		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT		SHEET : 1 OF 4	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD		REV 0	
<p><b>PIPING MATERIAL SPECIFICATION</b></p> <p><b>FOR CLASS A6J</b></p>					
0	19.11.20	ISSUED FOR ENGINEERING		SD	RZ BP
REV	DATE	DESCRIPTION		PREPARED BY	CHECKED BY APPROVED BY


		<b>PIPING MATERIAL SPECIFICATION</b> <b>A6J</b>													
<b>DOC. NO.</b> :1019-PI-PMS-105		<b>CLIENT</b> : SUN PETROCHEMICALS PVT LTD, KHAMBHAT											<b>SHEET</b> : 2 OF 4		
<b>PROJECT NO.</b> 1019		<b>PROJECT</b> : BHASKAR FIELD											<b>REV</b> 0		
<b>ASME CLASS</b>	<b>CORROSION ALLOWANCE</b>	<b>TEMPERATURE</b>	°C	80										<b>PIPE CLASS:</b>	
150#	NIL	<b>PRESSURE</b>	kg/cm <sup>2</sup> g	8										<b>A6J</b>	
<b>SERVICE:</b>		RAW WATER													
<b>BASIC MATERIAL :</b>		UNPLASTICIZED POLYVINYL CHLORIDE (UPVC)													
<b>NOTES:</b> 1) STUB-INS, ROD & FUSION WELDING ARE NOT PERMITTED. 2) CEMENT SOCKET JOINTS WITH UPVC SOLVENT CEMENT.															




			PIPING MATERIAL SPECIFICATION A6J						
DOC. NO. : 1019-PI-PMS-105			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 4 OF 4
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 0
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:
150#		NIL							A6J
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK.	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
PIPE	PIPE	PE	15	150	SCH. 80	-	ASTM D1785	ASTM D 1785 UPVC 1120 CL. 12454-B, SEAMLESS	
FLANGES	SOCKET	SOCKET	15	150	SCH. 80/ 150#	-	ASME B16.5	ASTM D 1784 CL. 12454-B, VANSTONE SOCKET TYPE WITH SOLID BACKING FLANGE	
	BLIND FLANGE	FF	15	150	150#	-	ASME B16.5		
FITTINGS	ELBOW 90°/45°	Socket	15	150	SCH. 80		ASTM D2467	ASTM D 2467; CL. 12454-B, SEAMLESS MOULDED SOCKET TYPE PRESSURE FITTINGS	
	EQUAL/RED. TEE	Socket	15	150	SCH. 80		ASTM D2467		
	CONC./ECC RED.	Socket	15	150	SCH. 80		ASTM D2467		
	CAP	Socket	15	150	SCH. 80		ASTM D2467		
	COUPLING	Socket	15	150	SCH. 80	-	ASTM D2467		
VALVES	BALL VALVE (FULL BORE)	FF/ B16.5	15	150	150#	-	MNF. STD.	BODY: UPVC, BALL: UPVC, SEAT: UPVC	
	CHECK VALVE (WAFER TYPE)	FF/B 16.5	50	150	150#	-	MNF. STD.	BODY: UPVC, BALL: UPVC, SEAT: UPVC	
GASKET/BOLT	STUD BOLT	-	15	150	-	-	ASME B18.2.1 ASME B18.2.2	BOLT : A 193 GR. B7 NUT : A 194 GR. 2H	WITH IS 2062 PLAIN WASHERS
	GASKET	-	15	150	3mm/ 150#	-	B16.21 ANSI B16.5	FULL FACE, BUTYL RUBBER	
STRAINER	STRNR PERM.	FF/ B16.5	15	80	150#	-	MNF. STD.	BODY : UPVC; INT : 13% CR STEEL	Y-TYPE


	<b>PIPING MATERIAL SPECIFICATION</b> <b>A7A</b>						
DOC. NO.	: 1019-PI-PMS-106	CLIENT	: SUN PETROCHEMICALS PVT LTD, KHAMBHAT			SHEET	: 1 OF 5
PROJECT NO.	1019	PROJECT	: BHASKAR FIELD			REV	3
<b>PIPING MATERIAL SPECIFICATION</b> <b>FOR CLASS A7A</b>							
3	07.08.2020	ISSUED FOR ENGINEERING			SD	RZ	BP
2	03.02.2020	ISSUED FOR ENGINEERING			RZ	RZ	BP
1	18.11.2019	REVISED AS MARKED			IJ	RZ	BP
0	06.06.2019	ISSUED FOR REVIEW			IJ	RZ	BP
REV	DATE	DESCRIPTION			PREPARED BY	CHECKED BY	APPROVED BY






		<div> <div>PIPING MATERIAL SPECIFICATION</div> <div>A7A</div> </div>												
DOC. NO. : 1019-PI-PMS-106		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT										SHEET : 2 OF 5		
PROJECT NO. 1019		PROJECT : BHASKAR FIELD										REV 3		
ASME CLASS	CORROSION ALLOWANCE	TEMPERATURE	°C	-29	38	50	100	150						PIPE CLASS:
150#	3 mm	PRESSURE	kg/cm <sup>2</sup> g	19.98	19.98	19.57	18.04	16.11						A7A
SERVICE:		EFFLUENT WATER, FLARE VENT, RAW WATER, VENT , EXPORT OIL , FIRE WATER ,												
BASIC MATERIAL :		CARBON STEEL (SEAMLESS)												
NOTES: <ol style="list-style-type: none"> <li>BUTT WELDED JOINT- 100% VISUAL, 10% RADIOGRAPHY</li> <li>BRANCH CONNECTION- 100% VISUAL; DYE PENETRANT TEST-10% (FOR ROOT RUN/FINAL RUN)</li> <li>VENT &amp; DRAIN SHALL HAVE FLANGED ENDS.</li> <li>TYPE OF STRAINERS ARE TENTATIVE, SELECTION OF STRAINER WILL BE AS PER P&amp;ID</li> </ol>														
ITEM	SIZE	DESCRIPTION												
MAINTENANCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM												
PIPE JOINTS	40 NB & BELOW	SW												
	50 NB & ABOVE	BUTTWELDED												
DRAIN (HYDRO)	ALL	25 NB												
VENT (HYDRO)	ALL	15 NB												
TEMP. CONN.	40 NB OR AS PER P&ID	FLANGED												
PRESS. CONN.	25 NB OR AS PER P&ID	AS PER P&ID												





			PIPING MATERIAL SPECIFICATION A7A							
DOC. NO. :1019-PI-PMS-106			CLIENT :SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 4 OF 5	
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 3	
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:	
150#		3 mm							A7A	
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK.	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS	
			LOW	HIGH				DESCRIPTION		
PIPE	PIPE	PE	15	20	SCH. 160	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)		
	PIPE	PE	25	40	SCH. 80	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)		
	PIPE	BE	50	50	SCH. 80	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)		
	PIPE	BE	80	150	SCH. 40	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)	REV-3	
	PIPE	BE	200	300	SCH. 40	-	ASME B36.10	ASTM A 53 GR. B (ERW)	REV-3 (FOR FW ONLY)	
	PIPE	BE	350	350	SCH. 40	-	ASME B36.10	ASTM A 53 GR. B (ERW)	REV-3 (FOR FW ONLY)	
	NIPPLE	PBE/ PE-NPT	15	40	SCH. 160	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)		
FLANGES	SLIP ON	RF	50	350	150#	125-250 μAARH	ASME B16.5	ASTM A 105	REV-3 (FOR FW ONLY)	
	SOCKET WELD	RF	15	20	150#/ SCH.160	125-250 μAARH	ASME B16.5	ASTM A 105		
	SOCKET WELD	RF	25	40	150#/ SCH.80	125-250 μAARH	ASME B16.5	ASTM A 105		
	WELD NECK	RF	50	50	150# / SCH.80	125-250 μAARH	ASME B16.5	ASTM A 105		
	WELD NECK	RF	80	150	150# / SCH.40	125-250 μAARH	ASME B16.5	ASTM A 105	REV-3	
	BLIND FLANGE	RF	15	350	150#	125-250 μAARH	ASME B16.5	ASTM A 105	REV-3	
	SPECTACLE BLIND	FF	15	350	150#	125-250 μAARH	ASME B16.48	ASTM A 105	REV-3	
FITTINGS	ELBOW 90°/45°	SW	15	20	6000#	-	ASME B16.11	ASTM A 105		
	ELBOW 90°/45°	SW	25	40	3000#	-	ASME B16.11	ASTM A 105		
	ELBOW 90°/45°	BW	50	50	SCH. 80	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S		
	ELBOW 90°/45°	BW	80	150	SCH. 40	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S		
	ELBOW 90°/45°	BW	200	300	SCH. 40	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S	REV-3 (FOR FW ONLY)	
	ELBOW 90°/45°	BW	350	350	SCH. 40	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S	REV-3 (FOR FW ONLY)	
	EQUAL/RED. TEE	SW	15	20	6000#	-	ASME B16.11	ASTM A 105		
	EQUAL/RED. TEE	SW	25	40	3000#	-	ASME B16.11	ASTM A 105		
	EQUAL/RED. TEE	BW	50	50	SCH. 80	-	ASME B16.9	ASTM A 234 GR. WPB -S		
	EQUAL/RED. TEE	BW	80	150	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB -S		
	EQUAL/RED. TEE	BW	200	300	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S	REV-3 (FOR FW ONLY)	
	EQUAL/RED. TEE	BW	350	350	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S	REV-3 (FOR FW ONLY)	
	CONC./ECC RED.	BW	50	50	SCH. 80	-	ASME B16.9	ASTM A 234 GR. WPB-S		
	CONC./ECC RED.	BW	80	150	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S		
	CONC./ECC RED.	BW	200	300	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S	REV-3 (FOR FW ONLY)	
	CONC./ECC RED.	BW	350	350	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S	REV-3 (FOR FW ONLY)	
	CONC./ECC SWG.	PBE	15	80	3000#	-	BS 3799	ASTM A 105		
	LETROLET	SW	25	40	3000#	-	MSS SP 97	ASTM A 105	REV-3	
	LETROLET	BW	50	150	3000#	-	MSS SP 97	ASTM A 105	REV-3	
	CAP	SW	15	20	6000#	-	ASME B16.11	ASTM A 105		
	CAP	SW	25	40	3000#	-	ASME B16.11	ASTM A 105		
	CAP	BW	50	50	SCH.80	-	ASME B16.9	ASTM A 234 GR. WPB-S		
	CAP	BW	80	150	SCH.40	-	ASME B16.9	ASTM A 234 GR. WPB-S		

			PIPING MATERIAL SPECIFICATION A7A						
DOC. NO. :1019-PI-PMS-106			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 5 OF 5
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 3
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:
150#		3 mm							A7A
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK.	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
FITTINGS	FULL COUPLING	SW / NPT	15	20	6000#	-	ASME B16.11	ASTM A 105	
	FULL COUPLING	SW / NPT	25	40	3000#	-	ASME B16.11	ASTM A 105	
	HALF COUPLING	SW	15	20	6000#	-	ASME B16.11	ASTM A 105	
	HALF COUPLING	SW	25	40	3000#	-	ASME B16.11	ASTM A 105	
	WELDOLET	BW	50	50	SCH.80	-	MSS SP 97	ASTM A 105	
	WELDOLET	BW	80	150	SCH.40	-	MSS SP 97	ASTM A 105	
VALVE	BALL VALVE (REDUCE BORE)	RF/ B16.5	15	150	150#	125-250 µAARH	EN ISO 17292	BODY: ASTM A 216 GR. WCB, TRIM: SS304, SEAT: PTFE	
	GATE VALVE	SW	15	40	800#	-	API-602	BODY : ASTM A 105, TRIM- STELLITED.	
	GATE VALVE	RF/ B16.5	50	150	150#	125-250 µAARH	API-600	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
	GATE VALVE	RF/ B16.5	200	350	150#	125-250 µAARH	API-600	BODY-ASTM A 216 GR.WCB, TRIM: 13% CR. STEEL, STEM-13% CR. STEEL.	REV-3 (FOR FW ONLY)
	GLOBE VALVE	SW	15	40	800#	-	EN ISO 15761	BODY : ASTM A 105, TRIM- STELLITED, STEM - 13% CR. STEEL	
	GLOBE VALVE	RF/ B16.5	50	150	150#	125-250 µAARH	BS-1873	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
	CHECK VALVE (LIFT TYPE)	SW	15	40	800#	-	EN ISO 15761	BODY - ASTM A 105, TRIM - STELLITED.	
	CHECK VALVE (SWING DISC)	RF/ B16.5	50	200	150#	125-250 µAARH	API- 594	BODY: ASTM A 216 GR. WCB, TRIM-13% CR.STEEL	REV-3
GASKET/BOLT	STUD BOLT	-	15	150	-	-	ASME B18.2.1 ASME B18.2.2	BOLT : A 193 GR. B7 NUT : A 194 GR. 2H	
	GASKET	-	15	150	4.5MM THK./150#	-	ASME B16.20 ASME B16.5	SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND CS OUTER RINGS.	


		<b>PIPING MATERIAL SPECIFICATION B7A</b>				
DOC. NO. : 1019-PI-PMS-107		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT			SHEET : 1 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD			REV 2	
<b>PIPING MATERIAL SPECIFICATION FOR CLASS B7A</b>						
2	05.06.20	ISSUED FOR ENGINEERING	SD	RZ	BP	
1	03.02.2020	ISSUED FOR ENGINEERING	RZ	RZ	BP	
0	18.09.2019	ISSUED FOR REVIEW	IJ	RZ	BP	
REV	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY	


		PIPING MATERIAL SPECIFICATION B7A											
DOC. NO. :1019-PI-PMS-107		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT										SHEET : 2 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD										REV 2	
ASME CLASS	CORROSION ALLOWANCE	TEMPERATURE	°C	-29	38	50	100	150					PIPE CLASS:
300#	3 mm	PRESSURE	kg/cm <sup>2</sup> g	52.11	52.11	51.08	47.52	45.98					
SERVICE:		PROCESS LIQUID, PROCESS VAPOR, BOTTOM RECYCLE, WELL FLUID, EXPORT OIL , HEAVY OIL, SERVO GAS											
BASIC MATERIAL :		CARBON STEEL (SEAMLESS)											
<b>NOTES:</b> <ol style="list-style-type: none"> <li>1) NDT OF WELDS SHALL BE AS FOLLOWS :  RADIOGRAPHY : ALL BUTT WELDS - 100%  MPI : SOCKET WELD - 100%</li> <li>2) ALL VENT AND DRAIN SHALL BE PROVIDED WITH GATE VALVE WITH BLIND FLANGE ASSEMBLY UNLESS OTHERWISE INDICATED IN P &amp; ID.</li> <li>3) PIPING DESIGN AS PER ASME B31.3</li> <li>4) ALL BRANCH CONNECTIONS INCLUDING VENT, DRAIN, PRESSURE AND TEMPERATURE CONNECTION SHALL BE AS PER BRANCH CONNECTION TABLE.</li> <li>5) FOR VALVE REFER RESPECTIVE VALVE DATA SHEET.</li> </ol>													
ITEM	SIZE	DESCRIPTION											
MAINTENANCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM											
PIPE JOINTS	40 NB & BELOW	FULL COUPLING											
	50 NB & ABOVE	BUTTWELDED											
DRAIN (HYDRO)	ALL	25 NB											
VENT (HYDRO)	ALL	15 NB											
TEMP. CONN.	40 NB OR AS PER P&ID	FLANGED											
PRESS. CONN.	25 NB OR AS PER P&ID	HALF COUPLING+PIPE+FLANGE+VALVE (SPEC. AS PER P&ID)											




			PIPING MATERIAL SPECIFICATION B7A							
DOC. NO. :1019-PI-PMS-107			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 4 OF 5	
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 2	
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:	
300#		3 mm							B7A	
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK.	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS	
			LOW	HIGH				DESCRIPTION		
PIPE	PIPE	PE	15	20	SCH. 160	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)		
	PIPE	PE	25	40	SCH. 80	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)		
	PIPE	BE	50	50	SCH. 80	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)		
	PIPE	BE	80	300	SCH. 40	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)		
	NIPPLE	PBE/ PE-NPT	15	40	SCH. 160	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)		
FLANGES	SOCKET WELD	RF	15	40	300#/ SCH.160	125-250 μAARH	ASME B16.5	ASTM A 105		
	WELD NECK	RF	50	50	300# / SCH.80	125-250 μAARH	ASME B16.5	ASTM A 105		
	WELD NECK	RF	80	300	300# / SCH.40	125-250 μAARH	ASME B16.5	ASTM A 105		
	BLIND FLANGE	RF	15	300	300#	125-250 μAARH	ASME B16.5	ASTM A 105		
	SPECTACLE BLIND	FF	15	40	300#	125-250 μAARH	ASME B16.48	ASTM A 105		
	SPECTACLE BLIND	FF	50	150	300#	125-250 μAARH	ASME B16.48	ASTM A 105		
FITTINGS	ELBOW 90°/45°	SW	15	20	6000#	-	ASME B16.11	ASTM A 105		
	ELBOW 90°/45°	SW	25	40	3000#	-	ASME B16.11	ASTM A 105		
	ELBOW 90°/45°	BW	50	50	SCH.80	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S		
	ELBOW 90°/45°	BW	80	300	SCH.40	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S		
	EQUAL/RED. TEE	SW	15	20	6000#	-	ASME B16.11	ASTM A 105		
	EQUAL/RED. TEE	SW	25	40	3000#	-	ASME B16.11	ASTM A 105		
	EQUAL/RED. TEE	BW	50	50	SCH.80	-	ASME B16.9	ASTM A 234 GR. WPB-S		
	EQUAL/RED. TEE	BW	80	300	SCH.40	-	ASME B16.9	ASTM A 234 GR. WPB-S		
	CONC./ECC RED.	BW	80	300	SCH.40	-	ASME B16.9	ASTM A 234 GR. WPB -S		
	CONC./ECC SWG.	PBE	15	80	3000#	-	BS 3799	ASTM A 105		
	CAP	SW	15	20	6000#	-	ASME B16.11	ASTM A 105		
	CAP	SW	25	40	3000#	-	ASME B16.11	ASTM A 105		
	CAP	BW	50	50	SCH.80	-	ASME B16.9	ASTM A 234 GR. WPB -S		
	CAP	BW	80	300	SCH.40	-	ASME B16.9	ASTM A 234 GR. WPB -S		





			PIPING MATERIAL SPECIFICATION B7A						
DOC. NO. :1019-PI-PMS-107			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 5 OF 5
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 2
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:
300#		3 mm							B7A
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK.	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
FITTINGS	FULL COUPLING	SW / NPT	15	20	6000#	-	ASME B16.11	ASTM A 105	
	FULL COUPLING	SW / NPT	25	40	3000#	-	ASME B16.11	ASTM A 105	
	HALF COUPLING	SW	15	20	6000#	-	ASME B16.11	ASTM A 105	
	HALF COUPLING	SW	25	40	3000#	-	ASME B16.11	ASTM A 105	
	SOCKOLET	SW	15	20	6000#	-	MSS SP 97	ASTM A 105	
	SOCKOLET	SW	25	40	3000#	-	MSS SP 97	ASTM A 105	
	WELDOLET	BW	50	50	SCH.80	-	MSS SP 97	ASTM A 105	
	WELDOLET	BW	80	150	SCH.40	-	MSS SP 97	ASTM A 105	
VALVES	BALL VALVE (REDUCE BORE)	RF/ B16.5	15	40	300#	125-250 µAARH	EN ISO 17292	BODY: ASTM A 105, SEAT: RPTFE	
	BALL VALVE (REDUCE BORE)	RF/ B16.5	50	300	300#	125-250 µAARH	EN ISO 17292	BODY: ASTM A 216 GR. WCB, TRIM SEAT AISI 4140	
	GATE VALVE	SW	15	40	800#	-	API-602	BODY : ASTM A 105, TRIM- STELLITED.	
	GATE VALVE	RF/ B16.5	50	300	300#	125-250 µAARH	API-600	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
	GLOBE VALVE	SW	15	40	800#	-	EN ISO 15761	BODY : ASTM A 105, TRIM- STELLITED, STEM - 13% CR. STEEL	
	GLOBE VALVE	RF/ B16.5	50	300	300#	125-250 µAARH	BS-1873	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
	CHECK VALVE (LIFT)	SW	15	40	800#	-	EN ISO 15761	BODY - ASTM A 105, TRIM - STELLITED.	
	CHECK VALVE SWING CHECK)	RF/ B16.5	50	300	300#	125-250 µAARH	API-594	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
GASKET/BOLT	STUD BOLT	-	15	300	-	-	ASME B18.2.1 ASME B18.2.2	BOLT : A 193 GR. B7 NUT : A 194 GR. 2H	
	GASKET	-	15	300	4.5MM THK./300#	-	ASME B16.20 ASME B16.5	SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND CS OUTER RINGS.	


		<b>PIPING MATERIAL SPECIFICATION B8A</b>				
DOC. NO. : 1019-PI-PMS-108		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT			SHEET : 1 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD			REV 2	
<p><b>PIPING MATERIAL SPECIFICATION FOR CLASS B8A</b></p>						
2	11.02.2020	REVISED AS MARKED			RZ	BP
1	03.02.2020	ISSUED FOR ENGINEERING			RZ	BP
0	20.09.2019	ISSUED FOR REVIEW			IJ	BP
REV	DATE	DESCRIPTION			PREPARED BY	APPROVED BY


		<div style="text-align: center;"> <b>PIPING MATERIAL SPECIFICATION</b>  <b>B8A</b> </div>											
DOC. NO. : 1019-PI-PMS-108		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT										SHEET : 2 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD										REV 2	
ASME CLASS	CORROSION ALLOWANCE	TEMPERATURE	°C	-29	38	50	100						PIPE CLASS:
300#	3 mm	PRESSURE	kg/cm <sup>2</sup> g	52.11	52.11	51.08	47.52						
SERVICE:		WELL FLUID (PIPELINE)											
BASIC MATERIAL :		CARBON STEEL (SEAMLESS)											
<b>NOTES:</b> <ol style="list-style-type: none"> <li>1) NDT OF WELDS SHALL BE AS FOLLOWS :  RADIOGRAPHY : ALL BUTT WELDS - 100%  MPI : SOCKET WELD - 100%</li> <li>2) ALL VENT AND DRAIN SHALL BE PROVIDED WITH GATE VALVE WITH BLIND FLANGE ASSEMBLY UNLESS OTHERWISE INDICATED IN P &amp; ID.</li> <li>3) PIPING DESIGN AS PER ASME B31.4 &amp; OISD 141</li> <li>4) ALL BRANCH CONNECTIONS INCLUDING VENT, DRAIN, PRESSURE AND TEMPERATURE CONNECTION SHALL BE AS PER BRANCH CONNECTION TABLE.</li> <li>5) FOR VALVE REFER RESPECTIVE VALVE DATA SHEET.</li> <li>6) BARRED TEE SHALL BE WELDED TYPE FOR USE IN MAINLINE ONLY. MATERIAL SHALL BE AS PER ATTACHED TABLE-1 FOR PIPELINE SPECIALITY ITEMS.</li> <li>7) LR BEND, IJ, L/R, PIG SIG. SHALL BE FOR USE IN MAINLINE ONLY. (SPACIAL ITEMS)</li> </ol>													
ITEM	SIZE	DESCRIPTION											
MAINTENANCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM											
PIPE JOINTS	40 NB & BELOW	FULL COUPLING 3000#											
	50 NB & ABOVE	BUTTWELDED											
DRAIN (HYDRO)	ALL	25 NB											
VENT (HYDRO)	ALL	15 NB											
TEMP. CONN.	40 NB OR AS PER P&ID	FLANGED											
PRESS. CONN.	25 NB OR AS PER P&ID	HALF COUPLING+PIPE+FLANGE+VALVE (SPEC. AS PER P&ID)											



			PIPING MATERIAL SPECIFICATION B8A							
DOC. NO. :1019-PI-PMS-108			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 4 OF 5	
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 2	
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:	
300#		3 mm							B8A	
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK.	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS	
			LOW	HIGH				DESCRIPTION		
PIPE	PIPE	PE	15	40	SCH. 80	-	ASME B36.10	API 5L GR.B PSL2 (SEAMLESS)		
	PIPE	BE	50	150	SCH. 40	-	ASME B36.10	API 5L GR.B PSL2 (SEAMLESS)		
	NIPPLE	PBE/ PE-NPT	15	40	SCH. 80	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)		
FLANGES	SOCKET WELD	RF	15	40	300#/ SCH.80	125-250 μAARH	ASME B16.5	ASTM A 105		
	WELD NECK	RF	50	150	300# / SCH.40	125-250 μAARH	ASME B16.5	ASTM A 105		
	BLIND FLANGE	RF	15	150	300#	125-250 μAARH	ASME B16.5	ASTM A 105		
	SPECTACLE BLIND	RF	15	150	300#	125-250 μAARH	ASME B16.48	ASTM A 105		
FITTINGS	ELBOW 90°/45°	SW	15	40	3000#	-	ASME B16.11	ASTM A 105		
	ELBOW 90°/45°	BW	50	150	SCH.40	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S		
	EQUAL/RED. TEE	SW	15	40	3000#	-	ASME B16.11	ASTM A 105		
	EQUAL/RED. TEE	BW	50	150	SCH.40	-	ASME B16.9	ASTM A 234 GR. WPB-S		
	CONC./ECC RED.	BW	50	150	SCH.40	-	ASME B16.9	ASTM A 234 GR. WPB-S		
	CONC./ECC SWG.	PBE	15	80	3000#	-	BS 3799	ASTM A 105		
	CAP	SW	15	40	3000#	-	ASME B16.11	ASTM A 105		
	CAP	BW	50	150	SCH.40	-	ASME B16.9	ASTM A 234 GR. WPB-S		


			PIPING MATERIAL SPECIFICATION B8A						
DOC. NO. :1019-PI-PMS-108			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 5 OF 5
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 2
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:
300#		3 mm							B8A
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK.	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
FITTINGS	FULL COUPLING	SW / NPT	15	40	3000#	-	ASME B16.11	ASTM A 105	
	HALF COUPLING	SW	15	40	3000#	-	ASME B16.11	ASTM A 105	
	SOCKOLET	SW	15	40	3000#	-	ASME B16.11	ASTM A 105	
	WELDOLET	BW	50	150	SCH.40	-	MSS SP 97	ASTM A 105	
VALVES	BALL VALVE (FULL BORE)	RF/ B16.5	15	40	300#	125-250 µAARH	EN ISO 17292	BODY: ASTM A 105, SEAT: RPTFE	
	BALL VALVE (FULL BORE)	RF/ B16.5	50	150	300#	125-250 µAARH	EN ISO 17293	BODY: ASTM A 216 GR. WCB, TRIM SEAT AISI 4140	
	BALL VALVE (REDUCE BORE)	RF/ B16.5	15	40	300#	125-250 µAARH	EN ISO 17292	BODY: ASTM A 105, SEAT: RPTFE	2
	BALL VALVE (REDUCE BORE)	RF/ B16.5	50	150	300#	125-250 µAARH	EN ISO 17293	BODY: ASTM A 216 GR. WCB, TRIM SEAT AISI 4140	2
	GATE VALVE	SW	15	40	800#	-	API-602	BODY : ASTM A 105, TRIM- STELLITED.	
	GATE VALVE	RF/ B16.5	50	150	300#	125-250 µAARH	API-6D	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
	GLOBE VALVE	SW	15	40	800#	-	BS-1873	BODY : ASTM A 105, TRIM- STELLITED, STEM - 13% CR. STEEL	
	GLOBE VALVE	RF/ B16.5	50	150	300#	125-250 µAARH	BS-1873	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
	CHECK VALVE (LIFT)	SW	15	40	800#	-	EN ISO 15761	BODY - ASTM A 105, TRIM - STELLITED.	
	CHECK VALVE (SWING CHECK)	RF/ B16.5	50	150	300#	125-250 µAARH	API-594	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
GASKET/B	STUD BOLT	-	15	150	-	-	ASME B18.2.1 ASME B18.2.2	BOLT : A 193 GR. B7 NUT : A 194 GR. 2H	
	GASKET	-	15	150	4.5MM THK./300#	-	ASME B16.20 ASME B16.5	SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND CS OUTER RINGS.	




		<b>PIPING MATERIAL SPECIFICATION</b> <b>D3A_EXPORT LINE</b>			
DOC. NO. : 1019-PI-PMS-109		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT		SHEET : 1 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD		REV 2	
<p><b>PIPING MATERIAL SPECIFICATION</b>  <b>FOR CLASS D3A_EXPORT LINE</b></p>					
2	11.02.2020	REVISED AS MARKED	RZ	RZ	BP
1	03.02.2020	ISSUED FOR ENGINEERING	RZ	RZ	BP
0	18-09-2019	ISSUED FOR REVIEW	IJ	RZ	BP
REV	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY


		<b>PIPING MATERIAL SPECIFICATION</b> <b>D3A_EXPORT LINE</b>											
<b>DOC. NO.</b> : 1019-PI-PMS-109		<b>CLIENT</b> : SUN PETROCHEMICALS PVT LTD, KHAMBHAT										<b>SHEET</b> : 2 OF 5	
<b>PROJECT NO.</b> 1019		<b>PROJECT</b> : BHASKAR FIELD										<b>REV</b> 2	
<b>ASME CLASS</b>	<b>CORROSION ALLOWANCE</b>	<b>TEMPERATURE</b>	<b>°C</b>	-29	38	50	100	150					<b>PIPE CLASS:</b>
600#	1.6 mm	<b>PRESSURE</b>	<b>kg/cm<sup>2</sup> g</b>	104.11	104.11	102.17	95.03	91.97					<b>D3A</b>
<b>SERVICE:</b>		EXPORT OIL (PIPELINE)											
<b>BASIC MATERIAL :</b>		CARBON STEEL (SEAMLESS)											
<b>NOTES:</b> <ol style="list-style-type: none"> <li>1) NDT OF WELDS SHALL BE AS FOLLOWS :  RADIOGRAPHY : ALL BUTT WELDS - 100%  MPI : SOCKET WELD - 100%</li> <li>2) ALL VENT AND DRAIN SHALL BE PROVIDED WITH GATE VALVE WITH BLIND FLANGE ASSEMBLY UNLESS OTHERWISE INDICATED IN P &amp; ID.</li> <li>3) PIPING DESIGN AS PER ASME B31.4 &amp; OISD 141</li> <li>4) CHARPY V-NOTCH TEST &amp; HARDNESS TEST SHALL BE CONDUCTED FOR PIPE, FITTING AND FLANGES.</li> <li>5) ALL BRANCH CONNECTIONS INCLUDING VENT, DRAIN, PRESSURE AND TEMPERATURE CONNECTION SHALL BE AS PER BRANCH CONNECTION TABLE.</li> <li>6) FOR VALVE REFER RESPECTIVE VALVE DATA SHEET.</li> <li>7) BARRED TEE SHALL BE WELDED TYPE FOR USE IN MAINLINE ONLY. MATERIAL SHALL BE AS PER ATTACHED TABLE-1 FOR PIPELINE SPECIALITY ITEMS.</li> <li>8) LR BEND, IJ, L/R, PIG SIG. SHALL BE FOR USE IN MAINLINE ONLY.</li> </ol>													
<b>ITEM</b>	<b>SIZE</b>	<b>DESCRIPTION</b>											
<b>MAINTENANCE JOINTS</b>	ALL	FLANGED, TO BE KEPT MINIMUM											
<b>PIPE JOINTS</b>	40 NB & BELOW	FULL COUPLING 3000#											
	50 NB & ABOVE	BUTTWELDED											
<b>DRAIN (HYDRO)</b>	ALL	25 NB											
<b>VENT (HYDRO)</b>	ALL	15 NB											
<b>TEMP. CONN.</b>	40 NB OR AS PER P&ID	FLANGED											
<b>PRESS. CONN.</b>	25 NB OR AS PER P&ID	HALF COUPLING+PIPE+FLANGE+VALVE (SPEC. AS PER P&ID)											







			PIPING MATERIAL SPECIFICATION D3A_EXPORT LINE							
DOC. NO. :1019-PI-PMS-109			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 4 OF 5	
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 2	
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:	
600#		1.6 mm							D3A	
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK.	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS	
			LOW	HIGH				DESCRIPTION		
PIPE	PIPE	PE	15	40	SCH. 80	-	ASME B36.10	API 5L X42 PSL2 (SEAMLESS)		
	PIPE	BE	50	400	SCH. 40	-	ASME B36.10	API 5L X42 PSL2 (SEAMLESS)		
	NIPPLE	PBE / PE-NPT	15	40	SCH. 80	-	ASME B36.10	API 5L X42 PSL2 (SEAMLESS)		
FLANGES	SOCKET WELD	RF	15	40	600#/SCH.80	125-250 μAARH	ASME B16.5	ASTM A 105		
	WELD NECK	RF	50	400	600#/SCH.40	125-250 μAARH	ASME B16.5	ASTM A 105		
	BLIND FLANGE	RF	15	400	600#	125-250 μAARH	ASME B16.5	ASTM A 105		
	SPECTACLE BLIND	FF	15	40	600#	125-250 μAARH	ASME B16.48	ASTM A 105		
	SPECTACLE BLIND	FF	50	150	600#	125-250 μAARH	ASME B16.48	ASTM A 105		
FITTINGS	ELBOW 90°/45°	SW	15	20	3000#	-	ASME B16.11	ASTM A 105		
	ELBOW 90°/45°	SW	25	40	3000#	-	ASME B16.11	ASTM A 105		
	ELBOW 90°/45°	BW	50	400	SCH. 40	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S		
	EQUAL/RED. TEE	SW	15	20	3000#	-	ASME B16.11	ASTM A 105		
	EQUAL/RED. TEE	SW	25	40	3000#	-	ASME B16.11	ASTM A 105		
	EQUAL/RED. TEE	BW	50	400	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S		
	CONC./ECC RED.	BW	50	400	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S		
	CONC./ECC SWG.	PBE	15	80	3000#	-	BS 3799	ASTM A 105		
	CAP	SW	15	20	3000#	-	ASME B16.11	ASTM A 105		
	CAP	SW	25	40	3000#	-	ASME B16.11	ASTM A 105		
	CAP	BW	50	150	SCH. 40	-	ASME B16.9	ASTM A 234 GR. WPB-S		


			PIPING MATERIAL SPECIFICATION D3A_EXPORT LINE						
DOC. NO. :1019-PI-PMS-109			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 5 OF 5
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 2
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:
600#		1.6 mm							D3A
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK.	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
FITTINGS	FULL COUPLING	SW	15	20	3000#	-	ASME B16.11	ASTM A 105	
	FULL COUPLING	SW	25	40	3000#	-	ASME B16.11	ASTM A 105	
	HALF COUPLING	SW	15	20	3000#	-	ASME B16.11	ASTM A 105	
	HALF COUPLING	SW	25	40	3000#	-	ASME B16.11	ASTM A 105	
	SOCKOLET	SW	15	20	3000#	-	ASME B16.11	ASTM A 105	
	SOCKOLET	SW	25	40	3000#	-	ASME B16.11	ASTM A 105	
	WELDOLET	SW	50	150	SCH.40	-	MSS SP 97	ASTM A 105	
VALVES	BALL VALVE (FULL BORE)	RF/ B16.5	15	40	600#	125-250 µAARH	BS EN ISO 17292	BODY: ASTM A 105,SEAT: RPTFE	
	BALL VALVE (FULL BORE)	RF/ B16.5	50	150	600#	125-250 µAARH	BS EN ISO 17292	BODY: ASTM A 216 GR. WCB, TRIM SEAT AISI 4140	
	BALL VALVE (REDUCE BORE)	RF/ B16.5	15	40	600#	125-250 µAARH	BS EN ISO 17292	BODY: ASTM A 105,SEAT: RPTFE	
	BALL VALVE (REDUCE BORE)	RF/ B16.5	50	150	600#	125-250 µAARH	BS EN ISO 17292	BODY: ASTM A 216 GR. WCB, TRIM SEAT AISI 4140	
	GATE VALVE	SW	15	40	800#	-	API-602	BODY : ASTM A 105, TRIM- STELLITED.	
	GATE VALVE	RF/ B16.5	50	150	600#	125-250 µAARH	API-600	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
	GLOBE VALVE	SW	15	40	800#	-	BS-1873	BODY : ASTM A 105, TRIM- STELLITED, STEM - 13% CR. STEEL	
	GLOBE VALVE	RF/ B16.5	50	150	600#	125-250 µAARH	BS-1873	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
	CHECK VALVE (LIFT CHECK)	SW	15	40	800	-	BS-5352	BODY - ASTM A 105, TRIM - STELLITED.	
	CHECK VALVE (SWING CHECK)	RF/ B16.5	50	150	600#	125-250 µAARH	API-594	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
GASKET/BOLT	STUD BOLT	-	15	150	-	-	ASME B18.2.1 ASME B18.2.2	BOLT : A 193 GR. B7 NUT : A 194 GR. 2H	
	GASKET	-	15	150	4.5MM THK. / 600#	-	ASME B16.20 ASME B16.5	SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND CS OUTER RINGS.	

		PIPING MATERIAL SPECIFICATION D7A			
DOC. NO.	: 1019-PI-PMS-110	CLIENT	: SUN PETROCHEMICALS PVT LTD, KHAMBHAT	SHEET	: 1 OF 5
PROJECT NO.	1019	PROJECT	: BHASKAR FIELD	REV	2
<div>PIPING MATERIAL SPECIFICATION FOR CLASS D7A</div>					
2	25.05.2020	ISSUED FOR ENGINEERING		SD	RZ BP
1	03.02.2020	ISSUED FOR ENGINEERING		RZ	RZ BP
0	09.07.2019	ISSUED FOR REVIEW		IJ	RZ BP
REV	DATE	DESCRIPTION		PREPARED BY	CHECKED BY APPROVED BY


		PIPING MATERIAL SPECIFICATION D7A													
DOC. NO. : 1019-PI-PMS-110		CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT												SHEET : 2 OF 5	
PROJECT NO. 1019		PROJECT : BHASKAR FIELD												REV 2	
ASME CLASS	CORROSION ALLOWANCE	TEMPERATURE	°C	-29	38	50	100							PIPE CLASS:	
600#	3 mm	PRESSURE	kg/cm² g	104.11	104.11	102.17	95.03							D7A	
SERVICE:		PRODUCED WATER (EFFLUENT DISPOSAL PIPELINE)													
BASIC MATERIAL :		CARBON STEEL (SEAMLESS)													
NOTES:															
1) NDT OF WELDS SHALL BE AS FOLLOWS : RADIOGRAPHY : ALL BUTT WELDS - 100% MPI : SOCKET WELD - 100%															
2) ALL VENT AND DRAIN SHALL BE PROVIDED WITH GATE VALVE WITH BLIND FLANGE ASSEMBLY UNLESS OTHERWISE INDICATED IN P & ID.															
3) PIPING DESIGN AS PER ASME B31.4 & OISD 141															
4) CHARPHY V-NOTCH TEST & HARDNESS TEST SHALL BE CONDUCTED FOR PIPE , FITTINGS AND FLANGES.															
5) ALL BRANCH CONNECTIONS INCLUDING VENT, DRAIN, PRESSURE AND TEMPERATURE CONNECTION SHALL BE AS PER BRANCH CONNECTION TABLE.															
6) FOR VALVE REFER RESPECTIVE VALVE DATA SHEET.															
7) BARRED TEE SHALL BE WELDED TYPE FOR USE IN MAINLINE ONLY. MATERIAL SHALL BE AS PER ATTACHED TABLE-1 FOR PIPELINE SPECIALITY ITEMS.															
8) LR BEND, IJ, L/R, PIG SIG. SHALL BE FOR USE IN MAINLINE ONLY.															
ITEM	SIZE	DESCRIPTION													
MAINTENANCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM													
PIPE JOINTS	40 NB & BELOW	FULL COUPLING													
	50 NB & ABOVE	BUTTWELDED													
DRAIN (HYDRO)	ALL	25 NB													
VENT (HYDRO)	ALL	15 NB													
TEMP. CONN.	40 NB OR AS PER P&ID	FLANGED													
PRESS. CONN.	25 NB OR AS PER P&ID	HALF COUPLING+PIPE+FLANGE+VALVE (SPEC. AS PER P&ID)													


[illegible]

			PIPING MATERIAL SPECIFICATION D7A							
DOC. NO. : 1019-PI-PMS-110			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 4 OF 5	
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 2	
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:	
600#		3 mm							D7A	
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK.	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS	
			LOW	HIGH				DESCRIPTION		
PIPE	PIPE	PE	15	40	SCH. 160	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)	Rev.2	
	PIPE	BE	50	50	SCH. 160	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)	Rev.2	
	PIPE	BE	80	150	SCH. 80	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)	Rev.2	
	NIPPLE	PBE/ PE-NPT	15	40	SCH. 160	-	ASME B36.10	ASTM A 106 GR. B (SEAMLESS)	Rev.2	
FLANGES	SOCKET WELD	RF	15	40	600#/ SCH.160	125-250 μAARH	ASME B16.5	ASTM A 105	Rev.2	
	WELD NECK	RF	50	50	600# / SCH.160	125-250 μAARH	ASME B16.5	ASTM A 105	Rev.2	
	WELD NECK	RF	80	150	600# / SCH.80	125-250 μAARH	ASME B16.5	ASTM A 105	Rev.2	
	BLIND FLANGE	RF	15	150	600#	125-250 μAARH	ASME B16.5	ASTM A 105		
	SPECTACLE BLIND	RF	15	40	600#	125-250 μAARH	ASME B16.48	ASTM A 105		
	SPECTACLE BLIND	RF	50	150	600#	125-250 μAARH	ASME B16.48	ASTM A 105		
FITTINGS	ELBOW 90°/45°	SW	15	40	3000#	-	ASME B16.11	ASTM A 105		
	ELBOW 90°/45°	BW	50	50	SCH.160	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S	Rev.2	
	ELBOW 90°/45°	BW	80	150	SCH.80	R = 1.5D	ASME B16.9	ASTM A 234 GR. WPB-S	Rev.2	
	EQUAL/RED. TEE	SW	15	40	3000#	-	ASME B16.11	ASTM A 105		
	EQUAL/RED. TEE	BW	50	50	SCH.160	-	ASME B16.9	ASTM A 234 GR. WPB-S	Rev.2	
	EQUAL/RED. TEE	BW	80	150	SCH.80	-	ASME B16.9	ASTM A 234 GR. WPB-S	Rev.2	
	CONC./ECC RED.	BW	50	50	SCH.160	-	ASME B16.9	ASTM A 234 GR. WPB -S	Rev.2	
	CONC./ECC RED.	BW	80	150	SCH.80	-	ASME B16.9	ASTM A 234 GR. WPB -S	Rev.2	
	CONC./ECC SWG.	PBE	15	80	3000#	-	BS 3799	ASTM A 105		
	CAP	SW	15	40	6000#	-	ASME B16.11	ASTM A 105		
	CAP	BW	50	50	SCH.160	-	ASME B16.9	ASTM A 234 GR. WPB-S	Rev.2	
	CAP	BW	80	150	SCH.80	-	ASME B16.9	ASTM A 234 GR. WPB-S	Rev.2	


			PIPING MATERIAL SPECIFICATION D7A						
DOC. NO. : 1019-PI-PMS-110			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 5 OF 5
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 2
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:
600#		3 mm							D7A
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK.	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
FITTINGS	FULL COUPLING	SW / NPT	15	40	6000#	-	ASME B16.11	ASTM A 105	
	HALF COUPLING	SW	15	40	6000#	-	ASME B16.11	ASTM A 105	
	SOCKOLET	SW	15	40	6000#	-	MSS SP 97	ASTM A 105	
	WELDOLET	BW	50	50	SCH.160	-	MSS SP 97	ASTM A 105	Rev.2
	WELDOLET	BW	80	150	SCH.80	-	MSS SP 97	ASTM A 105	Rev.2
VALVES	BALL VALVE (FULL BORE)	RF/ B16.5	15	40	600#	125-250 µAARH	EN ISO 17292	BODY: ASTM A 105,SEAT: RPTFE	
	BALL VALVE (FULL BORE)	RF/ B16.5	50	150	600#	125-250 µAARH	EN ISO 17293	BODY: ASTM A 216 GR. WCB, TRIM SEAT AISI 4140	
	GATE VALVE	SW	15	40	800#	-	API-602	BODY : ASTM A 105, TRIM- STELLITED.	
	GATE VALVE	RF/ B16.5	50	150	600#	125-250 µAARH	API-600	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
	GLOBE VALVE	SW	15	40	800#	-	BS-1873	BODY : ASTM A 105, TRIM- STELLITED, STEM - 13% CR. STEEL	
	GLOBE VALVE	RF/ B16.5	50	150	600#	125-250 µAARH	BS-1873	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
	CHECK VALVE	SW	15	40	800#	-	EN ISO 15761	BODY - ASTM A 105, TRIM - STELLITED.	
	CHECK VALVE	RF/ B16.5	50	150	600#	125-250 µAARH	API 594	BODY-ASTM A 216 GR.WCB, TRIM-STELLITED, STEM-13% CR. STEEL.	
GASKET/BO	STUD BOLT	-	15	150	-	-	ASME B18.2.1 ASME B18.2.2	BOLT : A 193 GR. B7 NUT : A 194 GR. 2H	
	GASKET	-	15	150	4.5MM THK./600#	-	ASME B16.20 ASME B16.5	SPIRAL WOUND GRAPHOIL FILLED, SS316 INNER AND CS OUTER RINGS.	



		<b>PIPING MATERIAL SPECIFICATION</b> <b>A5J</b>			
<b>DOC. NO.</b> :1019-PI-PMS-111		<b>CLIENT</b> : SUN PETROCHEMICALS PVT LTD, KHAMBHAT		<b>SHEET</b> : 1 OF 4	
<b>PROJECT NO.</b> 1019		<b>PROJECT</b> : BHASKAR FIELD		<b>REV</b> 0	
<p><b>PIPING MATERIAL SPECIFICATION</b></p> <p><b>FOR CLASS A5J</b></p>					
0	19.11.2020	ISSUED FOR ENGINEERING		SD	RZ BP
<b>REV</b>	<b>DATE</b>	<b>DESCRIPTION</b>		<b>PREPARED BY</b>	<b>CHECKED BY</b> <b>APPROVED BY</b>

		<b>PIPING MATERIAL SPECIFICATION</b> <b>A5J</b>													
<b>DOC. NO.</b> :1019-PI-PMS-111		<b>CLIENT</b> : SUN PETROCHEMICALS PVT LTD, KHAMBHAT											<b>SHEET</b> : 2 OF 4		
<b>PROJECT NO.</b> 1019		<b>PROJECT</b> : BHASKAR FIELD											<b>REV</b> 0		
<b>ASME CLASS</b>	<b>CORROSION ALLOWANCE</b>	<b>TEMPERATURE</b>	°C	80										<b>PIPE CLASS:</b>	
150#	NIL	<b>PRESSURE</b>	kg/cm <sup>2</sup> g	12										<b>A5J</b>	
<b>SERVICE:</b>		DOSING CHEMICALS													
<b>BASIC MATERIAL :</b>		CHLORINATED POLYVINYL CHLORIDE (CPVC)													
<b>NOTES:</b> 1) STUB-INS, ROD & FUSION WELDING ARE NOT PERMITTED. 2) CEMENT SOCKET JOINTS WITH CPVC SOLVENT CEMENT ASTM F493 IN ACCORDANCE WITH ASTM D2855 TO BE USED.															





			PIPING MATERIAL SPECIFICATION A5J						
DOC. NO. : 1019-PI-PMS-111			CLIENT : SUN PETROCHEMICALS PVT LTD, KHAMBHAT						SHEET : 4 OF 4
PROJECT NO. 1019			PROJECT : BHASKAR FIELD						REV 0
ASME CLASS		CORROSION ALLOWANCE							PIPE CLASS:
150#		NIL							A5J
ITEM	TYPE	END CONN.	DIAMETER RANGE		SCH./THK.	FACE/ FINISH /RADIUS	DESIGN STD.	MATERIAL	REMARKS
			LOW	HIGH				DESCRIPTION	
PIPE	PIPE	PE	15	150	SCH. 80	-	ASTM D 1785	ASTM F-441, CL 23447, CPVC, SEAMLESS	
FLANGES	SOCKET	SOCKET	15	150	SCH. 80/ 150#	-	ASME B16.5	F-439, CL 23447, VANSTONE SOCKET TYPE WITH SOLID BACKING FLANGE	
	BLIND FLANGE	FF	15	150	150#	-	ASME B16.5		
FITTINGS	ELBOW 90°/45°	SW	15	150	SCH. 80		ASTM D2467	ASTM F 439/; CL. 23447, SEAMLESS MOULDED SOCKET TYPE PRESSURE FITTINGS	
	EQUAL/RED. TEE	SW	15	150	SCH. 80		ASTM D2467		
	CONC./ECC RED.	SW	15	150	SCH. 80		ASTM D2467		
	CAP	SW	15	150	SCH. 80		ASTM D2467		
	COUPLING	SW	15	150	SCH. 80	-	ASTM D2467		
VALVES	BALL VALVE (FULL BORE)	FF/ B16.5	15	150	150#	-	MNF. STD.	BODY: CPVC, BALL: CPVC, SEAT: CPVC	
	CHECK VALVE (BALL LIFT TYPE)	FF/B 16.5	15	150	150#	-	MNF. STD.	BODY: CPVC, BALL: CPVC, SEAT: CPVC	
GASKET/BOLT	STUD BOLT	-	15	150	-	-	ASME B18.2.1 ASME B18.2.2	BOLT : A 193 GR. B7 NUT : A 194 GR. 2H	WITH IS 2062 PLAIN WASHERS
	GASKET	-	15	150	3mm/ 150#	-	B16.21 ANSI B16.5	FULL FACE, BUTYL RUBBER	
STRAINER	STRNR PERM.	FF/ B16.5	15	80	150#	-	MNF. STD.	BODY : CPVC; INT : 13% CR STEEL	Y-TYPE

## EQUIPMENT LIST (MECHANICAL)

DOCUMENT No: BHII-CPF-MEC-REP-2002

00	05-10-2023	ISSUED FOR APPROVAL	 MM	 KS	 SPV
REV	DATE	PURPOSE	PREPARED BY	CHECKED BY	APPROVED BY
 Global Maritime Consultants Group			 sun Petrochemicals		

										EQUIPMENT LIST (MECHANICAL)																			
DOCUMENT No: BHII-CPF-MEC-REP-2002										CLIENT: SUN PETROCHEMICALS PVT LTD										PAGE: 02 OF 02									
PROJECT NO : 23134										PROJECT: BHASKAR FIELD										REV : 00									
S. NO.	TAG NO.	TYPE	SEQ.ID	SUFFIX	DESCRIPTION	EQUIPMENT TYPE	SIZE			QUANTITY	DESIGN CAPACITY	SERVICE FLUID	DUTY	MOC	P&ID No	LOCATION (INDOOR/ OUTDOOR)	ORIENTATION	DESIGN		DRY WEIGHT (kg)	PHASE	UNIT RATE (INR) DISMANTLING	UNIT RATE (INR) INSTALLATION	UNIT RATE (INR) COMMISSIONING	REMARKS & NOTES				
							LENGTH	WIDTH/DIA	HT (mm)									PRESSURE (bar g)	TEMP (°C)										
1	E - 101	E	101	-	WELL FLUID - CRUDE OIL INTERCHANGER	SHELL & TUBE HEAT EXCHANGER	TUBE (STRAIGHT): 3.048 m	SHELL ID: 800 mm TUBE OD: 19.05 mm	-	1	TBA	SHELL SIDE: WELL FLUID (HYDROCARBON + PRODUCED WATER) TUBE SIDE: CRUDE OIL	433.6 kW	SHELL : CARBON STEEL TUBE : CARBON STEEL	1019-PS-PID-104	OUTDOOR	HORIZONTAL	SHELL SIDE: 10/FV TUBE SIDE: 10/FV	SHELL SIDE: 120 TUBE SIDE: 120	4145	LIQUID + GAS	₹	₹	- ₹	-	NEW, EXISTING TO BE DIMANTLED AND RETURNED TO WAREHOUSE			
3	P - 101	P	101	C/D	FEED BOOSTER PUMP	VERTICAL CAN PUMP	2000	15000	7000	2	63 m3/hr	STABILISED CRUDE	132 Kw	CARBON STEEL SS316	1019-PS-PID-104	OUTDOOR	VERTICAL	35.3	65	2726	LIQUID	₹	₹	- ₹	-	NEW			
4	P - 101	P	101	C/D	SEALING PLAN	SKIDDED	300	300	2000	2	N/A	N/A	N/A	N/A		OUTDOOR	VERTICAL			200	LIQUID	₹	₹	- ₹	-	NEW			
5	P - 102	P	102	C/D	OIL EXPORT PUMP	API MULTISTAGE CENTRIFUGAL PUMP	2000	4115	1250	2	63 m3/hr	STABILISED CRUDE	160 Kw	CARBON STEEL SS316	1019-PS-PID-104	OUTDOOR	HORIZONTAL	55	65	5600	LIQUID	₹	₹	- ₹	-	NEW			
6	P - 102	P	102	C/D	SEALING PLAN	SKIDDED	300	300	2000	4	N/A	N/A	N/A	N/A		OUTDOOR	VERTICAL			250	LIQUID	₹	₹	- ₹	-	NEW			
7	P - 104 A/B	P	104	A/B	TANK BOTTOM RECYCLE PUMP	CENTRIFUGAL PUMP	VTA	VTA	-	2 x 100%	1.5 m3/hr	CRUDE OIL	20 HP	SS316	1019-PS-PID-104	OUTDOOR	-	-	-	LIQUID	₹	₹	- ₹	-	EXISTING RELOCATION				
8	P - 117 A/B	P	117	A/B	PUMP HOUSE DRAIN PIT OIL LIFTING PUMP	CENTRIFUGAL PUMP	VTA	VTA	-	2 x 100%	6 m3/hr	DRAIN PIT OIL	7.5 HP	CARBON STEEL	1019-PS-PID-113	OUTDOOR	-	-	-	LIQUID	₹	₹	- ₹	-	EXISTING RELOCATION				
<b>NOTES:</b> 01. EQUIPMENT S.Nos 1 THROUGH 5 WILL BE NEW AND SHALL BE RECEIVED, UNLOADED, STORED, ERECTED, MECHANICALLY COMPLETED, PRE-COMMISSIONED AND COMMISSIONED BY THE CONTRACTOR. 02. EQUIPMENT S.Nos. 5 & 6 IS EXISTING AND SHALL BE DISMANTLED FROM THE PRESENT LOCATION AND SHALL BE INSTALLED INT THE NEW LOCATION.																													

## **SECTION – 5**

## **ANNEXURES**

**ANNEXURE – 1**

**BIDDERS RESPONSE ACKNOWLEDGMENT FORM FOR RECEIPT OF TENDER DOCUMENT**

As a delegated authority/representative of the organization named below, I have reviewed the contents of the package and on behalf of my Company, acknowledge the receipt of the same and advise that we will:

**BID** \_\_\_\_\_

**NOT BID** \_\_\_\_\_

Reason for no Bid

(optional): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

For

Name of Company : \_\_\_\_\_

Signature : \_\_\_\_\_

Title : \_\_\_\_\_

Date : \_\_\_\_\_

Transmittal via facsimile:

ATTENTION

Head – Commercial &SCM

Sun Petrochemicals Private Limited

8<sup>th</sup> Floor, ATL Corporate Park, Opp. L&T Gate no. 07,

Saki Vihar Road, Powai, Mumbai - 400072

Email: [dheeraj.paroch@sunpetro.com](mailto:dheeraj.paroch@sunpetro.com)



## ANNEXURE – 2

### BID BOND FORMAT

TO: Sun Petrochemicals Private Limited, a Company incorporated under the provisions of the Companies Act, 1956 and having its registered office at, 8th Floor, ATL Corporate Park, Opp. L&T Gate no. 07, Saki Vihar Road, Powai, Mumbai - 400072, India. (hereinafter referred to as "Company").

**WHEREAS:**

.....(hereinafter referred to as "Tenderer") has submitted a proposal dated .....("hereinafter referred to as Proposal") against **TENDER NO.:** \_\_\_\_\_ dated \_\_\_\_\_ for \_\_\_\_\_ (hereinafter referred to as the "Tender").

NOW, THEREFORE,

- (1) In response to the request made by the Tenderer, we (Name of Banker/Insurer : ) \_\_\_\_\_ (hereinafter called the "Guarantor") hereby irrevocably and unconditionally guarantee the sum of Indian Rupees \_\_\_\_\_/- (INR \_\_\_\_\_ for Indian Bidders) and US \$ \_\_\_\_\_ United States Dollars \_\_\_\_\_ only – for Foreign Bidders) in favor of Company , if Tenderer fails to perform its obligations as set forth below:
  - (i) The Tenderer agrees to keep the Proposal open for acceptance by Company during the period of validity (150 days from the Closing Date) specified in the Tender.
  - (ii) The Tenderer, having been notified of acceptance of its Proposal by Company during the period of Tender validity:
    - (a) Fails or refuses to execute the agreed Contract, if required; or
    - (b) Fails or refuses to furnish the Performance Bank Guarantee in accordance with the format provided in the Tender document; or
    - (c) Seeks Variation or modification of Proposal; modifications to the agreed terms and conditions
    - (d) Tries to influence Company on bid evaluation, bid comparison or Contract award decision.

The sum shall become payable by us immediately on first demand by Company without proof or conditions notwithstanding any constitution or protest by the Tenderer or any other third party.

- (2) Company shall have the fullest liberty without our consent and without affecting in any manner, our obligation hereunder, to relax any of the terms and conditions of the aforesaid Tender, from time to time, or to postpone any time any of the powers exercisable by Company against the said Tenderer and Guarantor shall not be relieved from its liabilities by reason of any such relaxation being granted to the Tenderer by Company or any indulgence by Company to the said Tenderer or by any such matters or things whatsoever.
- (3) The Guarantor shall not be discharged or released from this Guarantee by any Contract made between the Tenderer and Company with or without the consent of the Guarantor or by any alteration in the obligations undertaken by the Tenderer or by any change in name or constitution of Company or the Tenderer.
- (4) The Guarantee herein shall not be affected by any change in the constitution of the Bank or the Tenderer.
- (5) This Guarantee shall not be revoked during its currency, and shall remain in effect for One Hundred and fifty (150) days from the Tender Closing Date.

- (6) This Guarantee shall be governed and construed in accordance with the laws of India and all of the parties to this Guarantee hereby irrevocably submit to the non-exclusive jurisdiction of the High Court of Mumbai.

IN WITNESS whereof this Guarantee has been duly executed by GUARANTOR the \_\_\_\_\_ day of \_\_\_\_\_ for and on behalf of (\_\_\_\_\_)

Name : \_\_\_\_\_  
 Designation : \_\_\_\_\_  
 Banker's Seal: \_\_\_\_\_  
 Address : \_\_\_\_\_

**NOTE:**

**1. Bid bond required as Tender Security deposit /Earnest money**

It is a condition precedent to the acceptance of any Tender by the Company that the Tenderer shall provide a Bid Bond by means of a Bank Guarantee for an amount stated in the Invitation to Tender in the prescribed format and valid for a period of 150 days from the Closing Date. The Tender may be disqualified in the absence of a Bid Bond in the prescribed format. In providing such a Bid Bond the bank shall also undertake to issue the Performance Bank Guarantee as required by Company in the event that the Tender is accepted.

**2. Conditions for Invoking of Bid Bond Guarantee**

The following conditions would also lead to the invoking of Bid Bond Guarantee:

- a) If the Tender is withdrawn during the validity period or any extension thereof.
- b) If the Tender is varied or modified in a manner not acceptable to Company during the validity or agreed extension validity period duly agreed by the Tenderer or after notification of award by Company and prior to signing of the CONTRACT.
- c) If the successful Tenderer is seeking modifications to the agreed terms and conditions after notification of award or declines to accept the Letter of Intent/Award.
- d) If the successful Tenderer fails to furnish Performance Bank Guarantee within 10 days of the issue of the Letter of Intent/Award.
- e) Any effort by the Tenderer to influence Company on bid evaluation, bid comparison or Contract award decision.

The formats for any of the Bank Guarantees shall not be changed except for any minor variations that the Bank may require. Failure to comply with this requirement may entail disqualification of the Tender.

## **ANNEXURE - 3**

### **CHECK LIST FOR BIDDING**

This portion of the Tender is intended to serve as a checklist to ensure that all information necessary to evaluate your proposal has been included. Please indicate Yes / No or Acceptable / Not Acceptable, whichever is not applicable.

#### **TECHNICAL**

1. Has the bidder quoted for full scope of work as specified in the tender?  
YES / NO
2. Has the bidder furnished the list of equipment that will be used in the performance of the work, along with their make, technical data, catalogue/ brochure of the manufacturer, etc.?  
YES / NO
3. Has the bidder furnished the minimum personnel proposed to be assigned to this work in the format provided at Annexure 12?  
YES / NO
4. Quality Control Manual and/ or Quality Control Program along with the Unpriced Techno Commercial Bid  
YES / NO

#### **COMMERCIAL**

5. Confirm whether the bidder has submitted a Bid Bond as per Clause mentioned in the Instructions to Bidders.  
YES / NO
6. Confirm whether the bidder agrees to furnish a performance Bank Guarantee  
YES / NO
7. Confirm that the prices quoted are firm and are inclusive of all taxes, duties, levies etc., applicable to personnel, equipment and materials to be used for execution of the Contract as per tender and extension period if exercised.  
  
YES / NO
8. Confirm whether the prices quoted are firm and applicable even if the work is awarded only in part.  
YES / NO
9. Has the bidder confirmed the Commencement Date?  
YES / NO
10. Confirm acceptance of Insurance liability as per Clause of the Model CONTRACT.  
YES / NO
11. Confirm acceptance of Force Majeure provision as per mentioned in the Model CONTRACT.  
YES / NO
12. Confirm acceptance of Liquidated Damages provision as per the Model CONTRACT.  
YES / NO
13. Confirm acceptance provision for Arbitration as per Clause of the Model CONTRACT.  
YES / NO
14. Confirm acceptance Taxes and Duties provision as per of the Model CONTRACT.  
YES / NO

15. Confirm whether Unpriced Technical bid with all annexures and enclosures have been furnished in duplicate (1Original + 1 copy) in a separate sealed cover. Ensure that Price Schedule of the Unpriced Technical bid is blank.  
YES / NO
16. Confirm whether Priced Commercial Bid (1 Original +1 Copy) comprising only the Price Schedule has been furnished.  
YES / NO
17. Has bidder ensured that there is no over-writing in the offer? Have corrections, if any, been properly attested/ initialled by the bidder.  
YES / NO
18. Has bidder ensured that the all pages of the bid documents including additional sheets, if any, attached by the bidder signed by the duly authorized officer of the bidder?  
YES / NO
19. Bidder ensured that proof of the signing authority.  
YES / NO
20. Does the bidder accept bid validity period?  
YES / NO
21. If the bid is submitted by a consortium, confirm whether the MOU of the consortium / JVC has been furnished.  
YES / NO
22. Have all the exceptions/deviations/conditions taken by the bidder, having cost impact or not, been listed in the format provided as Annexure 4 and attached with the Unpriced Techno Commercial Bid, without including the cost impact, if any?  
YES / NO
23. Has bidder proposed any incentive scheme?  
YES / NO
24. Has the bidder included the cost impact of incentive schemes in the Priced Commercial Bid only?  
YES / NO
25. Has the cost impact, if any, of the exceptions taken been attached with the Priced Commercial Bid?  
YES / NO
26. Confirm whether the bidder agrees for applicability of Indian Laws  
YES / NO

## ANNEXURE – 4

### EXCEPTION/DEVIATION/CONDITIONS PROFORMA

Any and all exceptions/deviations/conditions to the terms and conditions of Tender No.- ----- should be indicated here and submitted along with the Unpriced Techno Commercial Bid without any price impact. Price impact, if any, of the exceptions/ deviations shall be duly completed, in this proforma, and attached to the Priced Commercial Bid only. If the bidder does not intend to take any exception / deviation then he shall mark “No Exceptions Taken” in this proforma. If the proforma is left blank or if this sheet is not attached to the bid, then it will be presumed that bidder has not taken any exception/deviation/condition to the terms and conditions of the TENDER DOCUMENT. Company shall not take cognisance of any exception/deviation/condition (if any) indicated elsewhere except in this proforma.

Tender No. -

Technical Part (attach to Unpriced Techno Commercial Bid)

Section No, Page No. and Clause No.	Description of exception/ deviation/ condition	Reason(s) for exception/ deviation/ condition	Whether there is a Cost impact? ** (Yes / No)	Effect on Commence ment Date

\*\* Please do not indicate the price impact, if any, here.

Tender No.-

Commercial Part (attach to Priced Commercial Bid)

Currency : \_\_\_\_\_

**ANNEXURE -5**

**CUT-OUT SLIPS FOR UNPRICED TECHNICAL OFFER**

**DO NOT OPEN - THIS IS A TENDER QUOTATION**

**(TECHNICAL UN-PRICED OFFER)**

**Client : SUN PETROCHEMICALS PRIVATE LIMITED**

**Tender No. : \_\_\_\_\_**

**Project Name : \_\_\_\_\_**  
**\_\_\_\_\_**

**On CALL OUT BASIS**

**Bid Due Date : \_\_\_\_\_**

**From: \_\_\_\_\_ To: \_\_\_\_\_**

<b>(Bidder's Details)</b>	<b>Head- Commercial &amp;SCM</b> <b>SUN PETROCHEMICALS PRIVATE LIMITED</b> 8 <sup>th</sup> Floor, ATL Corporate Park, Opp. L&T Gate no. 07, Saki Vihar Road, Powai, Mumbai - 400072
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**(To be pasted on the outer envelope containing UNPRICED OFFER)**

=====

**ANNEXURE -6**

**CUT-OUT SLIPS FOR PRICED OFFER**

**DO NOT OPEN - THIS IS A TENDER QUOTATION**

**(PRICED OFFER)**

**Client : Sun Petrochemicals Private Limited**

**Tender No. : \_\_\_\_\_**

**Project Name : \_\_\_\_\_**  
\_\_\_\_\_

**Bid Due Date : \_\_\_\_\_**  
**From: \_\_\_\_\_ To: \_\_\_\_\_**  
\_\_\_\_\_

<b>(Bidder's Details)</b>	<b>Head- Commercial &amp;SCM SUN PETROCHEMICALS PRIVATE LIMITED 8<sup>th</sup> Floor, ATL Corporate Park, Opp. L&amp;T Gate no. 07, Saki Vihar Road, Powai, Mumbai - 400072.</b>
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**(To be pasted on the envelope containing PRICED OFFER)**

**ANNEXURE -7**

**CUT-OUT SLIPS FOR OUTER ENVELOPE**

**DO NOT OPEN - THIS IS A TENDER QUOTATION**

**(OUTER ENVELOPE CONTAINING TECHNICAL UN-PRICED OFFER + PRICED OFFER)**

**Client : SUN PETROCHEMICALS PRIVATE LIMITED**

**Tender No. : \_\_\_\_\_**

**Project Name : \_\_\_\_\_**  
**\_\_\_\_\_**

**On CALL OUT BASIS**

**Bid Due Date : \_\_\_\_\_**

**From: \_\_\_\_\_ To: \_\_\_\_\_**

<b>Bidder's Details)</b>	<b>Head- Commercial &amp; SCM</b> <b>SUN PETROCHEMICALS PRIVATE LIMITED</b> 8 <sup>th</sup> Floor, ATL Corporate Park, Opp. L&T Gate no. 07, Saki Vihar Road, Powai, Mumbai - 400072.
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**(To be pasted on the outer envelope containing PRICED & UNPRICED OFFER)**



# **ANNEXURE –8**

## **PROFORMA OF PERFORMANCE BANK GUARANTEE**

**TO: Sun Petrochemicals Private Limited**, a Company incorporated under Company's Law 1956 and having its office at 8<sup>th</sup> Floor, ATL Corporate Park, Opp. L&T Gate no. 07, Saki Vihar Road, Powai, Mumbai – 400072, India. (hereinafter referred to as **"Company"**).

### **WHEREAS:**

- (1) By an Contract / LOA / Purchase Order (PO) for----- (here in after referred to as the **"Contract / LOA / PO"**) between \_\_\_\_\_ hereinafter referred to as the (**"Supplier / Contractor"**) of the one part and Company of the other part, the Supplier agrees to perform the Work in accordance with the CONTRACT.
- (2) In response to the request made by Supplier / Contractor, we (Name of Banker:) \_\_\_\_\_ (hereinafter referred to as the **"Guarantor"**) hereby irrevocably and unconditionally guarantee in favour of Company, the payment of amounts (without any withholding, deduction or set off) upto. \_\_\_\_\_ (Rupees \_\_\_\_\_) being **10% of the estimated / Annualized Contract Value**, as guarantee for the obligations of the Supplier / Contractor to perform the Work in accordance with the PO / Contract / LOA. The sum shall become payable by us immediately on first demand by Company without proof or conditions notwithstanding any dispute or protest by the Supplier / Contractor or any other third party. Multiple demands may be made in respect of our guaranteed obligations.
- (3) We shall not be discharged or released from this Guarantee by any waiver, modification, Purchase Order (PO) / Contract / LOA made between the Supplier / Contractor and Company with or without our consent or by any alteration in the obligations undertaken by the Supplier / Contractor or by any forbearance whether as to payment, time performance or otherwise, or by any change in name or constitution of Company or the Supplier / Contractor.
- (4) This Guarantee is a continuing security and, accordingly, shall remain in operation for six months after the completion / termination of the PO / Contract / LOA.  
We agree that the Guarantee is given regardless of whether or not the sum outstanding occasioned by the loss, damages costs, expenses or otherwise incurred by Company is recoverable by legal action or arbitration.

The rights under this Guarantee shall be assignable by Company to third parties, if required. This Guarantee shall be governed by and construed in accordance with the laws of India.

The Guarantee herein contained shall not be determined or affected by the liquidation or winding up, dissolution or changes or constitution or insolvency of the said Supplier / Contractor but shall in all respects and for all purposes be binding and operative until payment of all money due to you in respect of such liabilities is paid.

**IN WITNESS** where of this Guarantee has been duly executed by GUARANTOR the \_\_\_\_\_ day of \_\_\_\_\_ 201\_\_\_\_ or and on behalf of \_\_\_\_\_).

Name : \_\_\_\_\_  
 Designation : \_\_\_\_\_  
 Banker's Seal : \_\_\_\_\_  
 Address : \_\_\_\_\_

## **ANNEXURE -9**

### **LIST OF APPROVED BANKS**

Guarantee issued from following banks will be accepted as PBG/SD/EMD/BID BOND

1. All Nationalised Banks and scheduled bank
2. Private Sector Banks- Axis Bank, ICICI Bank and HDFC Bank
3. Commercial Banks:
  - I. Kotak Mahindra Bank
  - II. Yes Bank
  - III. RBL Bank (The Ratnakar Bank Ltd)
  - IV. IndusInd Bank
  - V. Karur Vysya Bank
  - VI. DCB Bank
  - VII. Federal Bank
  - VIII. South Indian Bank
4. Co-operative and Rural Banks:
  - I. The Kalupur commercial co-operative bank Ltd
  - II. Rajkot Nagrik Sahakari Bank Ltd
  - III. The Ahmedabad Mercantile Co-operative Bank Ltd
  - IV. The Mehsana Urban Co-operative Bank Ltd
  - V. Nutan Nagrik Sahakari Bank Ltd
  - VI. Dena Gujarat Gramin Bank

## **ANNEXURE - 10**

### **CUSTOMS NOTIFICATION**

Custom Notifications will be applicable as per latest and relevant guidelines for goods imported in connection with the Contract signed with the Government of India as applicable under the relevant Production Sharing Contract (PSC) / New Exploration Licensing Policy (NELP).

## **ANNEXURE - 11**

### **CHECK LIST POST AWARD OF WORK**

**This check list is preliminary for vital compliance to be fulfilled by successful bidder at immediate post award stage and not limited to followings:**

#### **Commercial / Financial**

- a. Performance bank guarantee – value and validity
- b. PAN / TAN / GSTN number
- c. Bank Account number with documentary proof

#### **Operational**

- a. Detailed sequence of operations with ball park time estimates
- b. Availability of services & materials with time lines
- c. Lead time of critical spares
- d. Interface management of various services
- e. Logistics control
- f. Discussion and finalisation on incentives – Bonus/Malus
- g. Organogram with HSE set up

#### **General**

- a. Overall inputs required for meeting all operational needs

**ANNEXURE-12A:**  
**PERSONNEL DEPLOYMENT PLAN**

**Minimum Personnel to be provided by the Contractor**

Classification	Number On Location	Total Number

**ANNEXURE-12B**  
**PERFORMA FOR EXPERIENCE OF CONTRACTOR'S PERSONNEL**

Sr. No.	Name & address of the person with position	Age, Date Of Birth	Educational qualification & Year of Passing	Previous experience (Name & Address of previous Client)	Period		Type of Work /Job Responsibility	Remarks
					From	To		

Note:

1. Bidder is free to identify more personnel for each category as an alternative.
2. Bidders need to attach the bio-data along with the bid. Certificates to be enclosed along with this Performa.

**PROVISIONAL ACCEPTANCE CERTIFICATE**

CONTRACT /CONTRACT NO: .....

Date:.....

DESCRIPTION OF SUPPLIES / SERVICE:

.....  
The above SUPPLIES have been provisionally accepted with effect from ..... on behalf of  
.....(COMPANY) in good order with the exceptions as described in Appendix-  
1(if applicable), subject to the Delivery and Warranty conditions contained in the AGREEMENT,  
effective from .....

For and on behalf of:.....

(COMPANY)

Name

Designation

Signature

Date

**EXCEPTIONS TO COMPLETION**

**Ref : PROVISIONAL ACCEPTANCE CERTIFICATE**

COMPANY to detail below any and all exceptions to the completion of the SUPPLIES/SERVICES described in this PROVISIONAL ACCEPTANCE CERTIFICATE.



**FINAL ACCEPTANCE CERTIFICATE**

AGREEMENT/CONTRACT NO: .....

Date:.....

**DESCRIPTION OF SUPPLIES**

.....

The above SERVICE /SUPPLIES have been finally accepted on behalf of -----  
(COMPSNY) in apparent good order, subject to the Warranty conditions contained in the  
AGREEMENT, with effect from .....200.....

For and on behalf of: \_\_\_\_\_

(COMPANY)

Name

Designation

Signature

Date

Date

**END OF TENDER DOCUMENT**