

FORWARDING LETTER

Sub: TENDER NO. SDG8439P22/09 FOR PROCUREMENT OF 5 (FIVE) NUMBERS 2000 HP VFD DRILLING RIGS WITH TOP DRIVE & ACCESSORIES

Dear Sirs/Madam,

- 1.0 OIL INDIA LIMITED (OIL), a “Navaratna” Category, Government of India Enterprise, is a premier oil Company engaged in exploration, production and transportation of crude oil & natural gas with its Headquarters at Duliajan, Assam. Duliajan is well connected by Air with nearest Airport being at Dibrugarh, 45 km away.
- 2.0 In connection with its operations, OIL invites International Competitive Bids (ICB) from competent and experienced manufacturers through OIL’s e-procurement site for “**PROCUREMENT OF 5 (FIVE) NUMBERS 2000 HP VFD DRILLING RIGS WITH TOP DRIVE & ACCESSORIES**”. One complete set of Bid Document for above is uploaded in OIL’s e-procurement portal. You are invited to submit your most competitive bid on or before the scheduled bid closing date and time through OIL’s e-procurement portal. For your ready reference, few salient points of the Tender are highlighted below:

E-Tender No.	:	SDG8439P22/09 dated 30.09.2021
Type of Bidding	:	SINGLE STAGE TWO BID SYSTEM
Tender Fee	:	Not Applicable
Bid Closing Date & Time	:	03.11.2021; 11:00 HRS. (IST)
Technical Bid Opening Date & Time	:	03.11.2021; 14:00 HRS. (IST)
Price Bid Opening Date & Time	:	To be decided later and shall be intimated separately to the technically qualifying bidders.
Bid Security Amount	:	Not Applicable
Bid Security Validity	:	Not Applicable
Bid Submission Mode	:	Bids must be uploaded online in OIL’s E-procurement portal
Bid Opening Place	:	Office of GM-Materials, Materials Department, Oil India Limited, Duliajan -786602, Assam, India.
Bid Validity	:	Bid should be valid for 180 days from actual bid closing date.
Performance Guarantee	:	Applicable @ 3% of LOA value
Integrity Pact	:	Applicable. To be submitted as per attached format
Contact Details	:	M. B. SINGHA, CHIEF MANAGER MATERIALS (FP) E-MAIL: bikramjit_singha@oilindia.in PHONE: 0374 - 2808705 AMRIT L BORA, SENIOR MANAGER MATERIALS (FP) E-MAIL: mmfd1@oilindia.in PHONE: 0374-2808720
E-Tender technical Support	:	TEL: 0374- 2804903, 2807171, 2807192, E-MAIL: ERP_MM@oilindia.in
Bids to be addressed to	:	GM-Materials, Materials Department, Oil India Limited, Duliajan - 786602, Assam, India.
OIL’s office timings	:	Monday to Friday: 07:00 Hrs. to 11:00 Hrs. (IST) 12:30 Hrs. to 15:30 Hrs. (IST) Saturday: 07:00 Hrs. to 11:00 Hrs. (IST)
Query(ies) / Clarification(s) on the Tender	:	To be submitted through e-mail, addressed to mmfd1@oilindia.in / bikramjit_singha@oilindia.in

LIST OF ANNEXURES, APPENDICES & PROFORMAS		
General Terms & Conditions (GTC-1)	:	MM/GLOBAL/E-01/2005 for E-Procurement ICB Tenders
General Conditions of Contract (GTC - 2)	:	General Terms & Conditions for Services
Annexure – A	:	Tender details and various notes to bidders
Annexure – AA	:	Item specifications and detailed scope of work
Annexure – B	:	Bid Evaluation Criteria
Annexure – AA1	:	Electrical Annexure (Check List for Bidders)
Annexure – AA2	:	Evaluation Matrix for Technical Specification & Scope of Work
Annexure – B1	:	Evaluation Matrix for Bid Evaluation Criteria
Annexure – B2	:	Details of Manufacturing & Supply Experience against BEC/BRC
Annexure – C	:	Commercial Checklist
Annexure – D1	:	Price bid format for Indian Bidders
Annexure – D2	:	Price bid format for Foreign Bidders
Appendix – A1	:	Details of restrictions on procurement from a bidder of a country which shares land border with India
Appendix – A2	:	Purchase Preference (linked with local content) policy
Appendix –AA-I	:	Drilling Control System
Appendix –AA-II	:	API Certificates
Appendix –AA-III	:	Third party inspection
Appendix –AA-IV	:	Installation & Commissioning
Appendix –AA-V	:	HSE Points
Appendix –AA-VI	:	List of Mandatory Spares
Appendix –AA-VII	:	Running hours of Caterpillar Engine for retrofitting
Appendix –AA-VIII	:	Foot print of CAT engines
Appendix –AA-IX	:	Typical Single Line Diagram
Appendix –AA-X	:	Electrical - Statutory Guidelines
Proforma – A1	:	Format for Undertaking towards compliance of office memorandum F. No. 6/18/2019-PPD dated 23rd July, 2020
Proforma – A2	:	Format of undertaking towards submission of authentic information /documents
Proforma – A3	:	Format for Integrity Pact
Proforma – A4	:	Format for Bid Securing Declaration
Proforma – A5	:	Performance Security Format
Proforma – A6	:	Format for Inspection Certificate to be issued by Independent Inspection Agencies against Document Verification Clause
Proforma – A7	:	Format: Bank Guarantee linked with Advance Payment
Proforma – A8	:	Form 10F
Proforma – A9	:	Format for No Business Connection or Permanent Establishment Certificate
Proforma – B1	:	Format for undertaking towards compliance of Financial Criteria
Proforma – B2	:	Format for Annual Turn Over and Networth Certificate
Proforma – B3	:	Format: Parent/Ultimate Parent/ Holding Company's Corporate Guarantee Towards Financial Standing

3.0 OIL now looks forward to your active participation in the Tender.

Thanking you,
Yours faithfully,
OIL INDIA LIMITED

sd/-
(M. B. Singha)
Chief Manager Materials(FP)
For GM Materials (HoD)
For Resident Chief Executive

ANNEXURE-A

AA:: ITEM DETAILS & QUANTITY OF ITEMS:

Item No.	Item Details	Quantity
10	Supply of 2000 HP VFD Drilling Rig with Top Drive & Accessories	05 Nos.
20	Assembling, Installation & Commissioning, Training, Non-comprehensive AMC against Item No. 10	05 AU

FOR ITEM SPECIFICATIONS AND FOR DETAILED SCOPE OF WORK, ANNEXURES –AA IS TO BE REFERRED.

BB:: SPECIAL NOTES TO BIDDERS

- 1.0 **ELIGIBLE BIDDERS** - The bid should be from manufacturers as mentioned in Bid Evaluation/Rejection Criteria.
- 2.0 The bidders are advised to take note of the following terms and conditions and submit the confirmation/undertaking (wherever applicable) against each clause.
- 2.1 The following definitions will be applicable wherever appearing in the tender document:
- a) E&P Companies: Companies involved in Exploration and Production of Oil & Gas.
 - b) Drilling Contractors: Companies involved in providing Drilling Services along with Drilling Rigs and/or Manpower under contract with E & P companies for exploration of Oil & Gas.
 - c) Drilling Rig Package Integrators: Companies involved in manufacturing of some or all the Rig equipment/components and supplying of Drilling Rig Packages after integrating all the rig equipment/components, to E&P Companies/Drilling Contractors/Drilling Service Providers for exploration of Oil & Gas.
 - d) Drilling Service Providers to Oil and Gas industry: Companies involved in leasing of Drilling Rigs to E & P companies/Drilling Contractors for exploration of Oil & Gas.
- 2.2 The bidder shall set up a base in India to deal promptly with any technical issues arising during the normal warranty / guarantee period (as stated elsewhere in this tender). Bidder should additionally confirm in their technical bid that they will keep their technical personnel at OIL's Headquarter at Duliajan, Assam for trouble shooting & providing timely warranty/ guarantee/repair/ replacement/ operational & maintenance support services on regular basis as may be required during the normal warranty / guarantee (as stated elsewhere in this tender) for a period of 1 year (12 months) from successful commissioning of each rig package at site. The above services during warranty / guarantee period shall be provided without any additional cost to OIL.
- 2.3 The bidder shall supply latest version of the all the software used in drilling control system / Instrumentation system / VFDs etc., available at the time of delivery / commissioning.
- 2.4 The drilling control system software for operating the rig shall be licensed to Oil India Limited with lifetime validity and the bidder will be responsible for any update in software at no additional cost to OIL, and the software shall be made available to Oil India Limited for end of equipment cycle.
- 2.5 The bidder shall provide the software for structural analysis and evaluation of critical members of Mast and substructure. The software shall be capable / suitable to evaluate mast load bearing capacity and structural integrity of mast and substructure and identify the critical members.
- 2.6 **API CERTIFICATION:**
- a) Bidder should submit copies of API Certificates valid at the time of bidding in favour of the manufacturing facilities for the quoted Rig and Equipment (for items that are manufactured as per API specification) from where the supplies are intended to be made as detailed in the tender.
 - b) In case the API certificate(s) is / are under renewal for any one or more of the quoted manufacturing facilities at the time of bidding, then for each of such manufacturing facilities, the bidder should furnish letter(s) from API along with unpriced bid to the effect that the renewal of certificate is under examination process with API and the manufacture is authorized to use API monogram till the renewal certificate is issued.

- c) Bidder should confirm to provide Rig and Equipment / Items manufactured as per relevant API with monogram as mentioned in specifications indicated against each equipment / item along with a copy of valid API certificate from the manufacturer of the Rig and Equipment/items (as applicable) along with the supply of Rig Packages.
- 2.7 Bidder should furnish an undertaking for providing the product / service support along with uninterrupted and timely supply of spare parts atleast till ten (10) years from the date of commissioning of the last rig, for the quoted makes and models of equipment.
- 2.8 The successful bidder must give details of their after-sales service support / repair services that will be provided by them against their offered items/equipment, before placement of order.
- 2.9 For supply of major equipment and items (as mentioned in the Tender), the bidders should indicate the source of their brought-out items and clearly indicate the names of the Original Equipment Manufacturer for such brought out items, wherever applicable.
- 3.0 The successful bidder shall have to provide in the **Kick off Meeting**, schedule of activities for completing the delivery and third-party inspection of all the five (05) rigs within the rig delivery period. The same shall be held at Oil India Limited, Duliajan within 30 days from the date of letter of award (LOA). Cost of attending such Kick off meeting for bidder's personnel is to be borne by the successful bidder.
- 4.0 All the offered items of Rig package shall be brand new, unused, of recent manufacture, not manufactured from recycled steel and free from any manufacturing defect. This shall be categorically stated by the bidders in their quotations.
- 5.0 **GUARANTEE / WARRANTY**
- 5.1 The complete Drilling Rig package / unit shall be under guarantee / warranty by the successful bidder for a minimum period of 1 (one) year from the date of successful assembling / installation and commissioning of the each complete Drilling Rig package / unit at site. This clause will be applicable notwithstanding any warranty requirement specified specifically elsewhere in the tender.
- 5.2 OIL reserves the right to inspect, test and if necessary, reject any equipment / parts after delivery at site (including incomplete manuals, catalogues, etc.) in case of any fault on the part of the supplier. It shall in no way be waived by the reason that the equipment / parts were previously inspected & passed by OIL as per Inspection Clause detailed elsewhere in the tender.
- 5.3 To keep the unit fully operational, in case of failure of any equipment / parts during the warranty period, it is the supplier's responsibility to arrange replacement / repairing at site at their own cost including custom duty, IGST, freight, etc. within a period of maximum 5 (five) weeks from the date of notification of such failure.
- 5.4 Bidder should confirm in their technical bid that they will agree for keeping their technical personnel at OIL's Headquarter Duliajan, Assam for trouble shooting & providing timely warranty / guarantee / repair / replacement / operational and maintenance support services on regular basis as may be required during the normal warranty / guarantee for a period of 1 year (12 months) from successful commissioning of each rig package at site. During the warranty period, OIL will carry out operation & maintenance with supervisory support services from the supplier. However, no separate charge is payable to the supplier in this regard.
- 6.0 OIL expects offers without any deviation to OIL's stipulated specifications and terms & conditions. However, any deviation(s) from the tender specification should be clearly highlighted specifying justification in support of deviation. Acceptance/Non-acceptance of such deviations shall be at sole discretion of OIL.
- 6.1 The word 'equivalent' appearing after any indicated make of an item / equipment / accessory implies that any other make of such item / equipment / accessories is also acceptable provided that the specification as indicated in tender is met in toto.
- 7.0 Offers shall be complete in all respects and all the items/equipment as specified in the tender must be included in the package. Offers deemed to be incomplete shall be liable for outright rejection. (Bidders may quote additional items / equipment or accessories, other than Handling Equipment & Well Control Equipment, not covered in this enquiry, if felt necessary for the completeness and efficient operation of the rig package. Cost of such items should be included in the package cost).

- 8.0 The Bidder shall categorically confirm that the compatibility of all equipment offered has been thoroughly scrutinized and verified for smooth and trouble-free operation of the entire package to avoid unwarranted hitches during commissioning.
- 9.0 Quotations shall be accompanied by detailed technical specifications, manufacturer's printed specification sheets, literature, drawings, layout drawings & catalogues as indicated in English (UK & US).
- 10.0 Bidders must specify the weight of major components indicating the major dimensions.
- 11.0 Bidders should specifically note the document submission schedule indicated elsewhere (i.e., in sections) including special documents requiring statutory clearances.
- 12.0 All equipment to be supplied with the Rig Package shall be in full conformance to and monogrammed per the respective API Specification as mentioned in the tender viz. API Spec 4F, API Spec 5L, API Spec 7-1, API Spec 7-2, API Spec 7F, API Spec 7K, API Spec 8C, API Spec 9A, API RP 500 & API RP 13E, etc.
- 13.0 All electrical equipment that are to be used in "Zone 1" or "Zone 2" or hazardous area [within 30 mtrs. as per OMR 2017(96(3))] of oil mines shall be of explosion proof suitable for use in oilfield hazardous area, Zone-I or Zone-2, and Gas group IIA & II B of oil mines and shall conform to OMR-2017 and subsequent guidelines from DGMS, based on the actual placement of the equipment as per OEM layout.

Test reports conforming to the relevant standards of OMR-2017 from an Indian Government Laboratory or NABL accredited laboratory, IECEx accredited laboratory, or ATEX notified body, which is not a part of manufacturer's facility; shall be submitted with the quotation as well as during the supply of the Rig Package.

In case such Test Reports are not available at the time of submitting the offer, the same shall be submitted during Pre-Dispatch Inspection. The bidder shall categorically confirm the same in their offer. In case of failure to submit above test reports, dispatch clearance shall not be given.

14.0 **Cables:**

- 14.1 The power cables used for VFD Drilling motors shall be copper cables (braided or screened) of min 2000 V grade. The cables shall conform to the provisions stipulated in line with IEEE-1580 Type-P with the latest amendments and shall be suitable for use in Zone-I or Zone-II or hazardous area [within 30 mtrs. as per OMR 2017(96(3))] (whichever applicable) and Gas group II-A & II-B of oil mines."
- 14.2 All other electrical cables to be used in the VFD Drilling Rigs other than the power cables used for VFD Drilling Motors shall be copper cables (braided or screened) of min 1100 volts grade, EPR insulated, CSP/NBR sheathed. The cables shall conform to the provisions stipulated in line with IS-9968 read with the latest BHEL specifications (OR12003, OR12002 & OR12005) as the case may be. If the standard of a particular type of cable is not available in India, the cables must comply relevant international standards (IEC 502) with latest amendments. [Ref. to DGMS Tech. Circular (Electrical), (Approval) No. 17 dated 25/05/2015].
- 15.0 Bidders, quoting for any bought-out item(s) should undertake & comply with Guarantee / Warranty clause indicated elsewhere in this tender.
- 16.0 Among others, the bidders shall categorically confirm that prices of major rig components will be submitted as per the attached price bid format. However, such prices are to be submitted along with price bid only. Indication/disclosure of such prices in the technical bid shall lead to outright rejection of the offer.
- 17.0 **DELIVERY PERIOD:** The Drilling Rig package should be supplied as per the delivery schedule mentioned under Bid Evaluation Criteria (BEC)/Bid Rejection Criteria (BRC) (Annexure-B).
- 18.0 **INSTALLATION, COMMISSIONING, TRAINING & AMC:**
The Bidder should confirm the following:
- i) To complete assembling / installation and commissioning of all rigs, equipment and accessories in India at the locations to be specified by Oil India Limited and to the satisfaction of Oil India Limited. The broad scope of Installation and Commissioning is as mentioned elsewhere in the tender. The bidders should indicate separately the cost of assembling / installation and commissioning per rig and same shall be considered for evaluation purpose.

- ii) To undertake training for operational and maintenance personnel as per the scope of work defined in the tender. The broad scope of Training is as mentioned elsewhere in the tender. The bidders should indicate separately the cost of training to OIL personnel at locations in India or abroad and same shall be considered for evaluation purpose. Bidders to submit detailed training module clearly defining the scope, location and duration of the training along with the bid, otherwise bids will be rejected outright.
 - iii) To undertake AMC as per the scope of work defined in the tender. The broad scope of AMC is as mentioned elsewhere in the tender. The bidders should indicate separately the cost of year wise AMC and the same shall be considered for price bid evaluation. Bidders not quoting for AMC will be rejected outright.
- 19.0 The prices must be strictly submitted as per the price bid format only. The prices/rates offered against the tender must remain firm through delivery and not subject to variation on any account. A bid submitted with an adjustable price condition shall be treated as non-responsive and rejected. No discount whatsoever should be quoted separately. Rates/prices quoted must be net of all discounts.
- 20.0 Modality of placement of Letter of Award/Purchase Order to the successful L1 bidder will be as under:
- i) While a single Letter of Award will be issued for all five numbers of Drilling Rig Packages to the successful L1 bidder, separate Purchase Orders will be issued for the first lot (Two Rigs), second lot (Two Rigs) and third lot (One Rig). Delivery schedule of each lot of rigs shall be stipulated in the Letter of Award.
 - ii) Purchase Order No. for the first lot (Two Rigs) will be indicated in the Letter of Award and order will be released immediately after issuance of Letter of Award. Purchase Orders for the second lot (Two Rigs) and third lot (One Rig) will be issued to the supplier at least 15 months before scheduled delivery.
 - iii) Performance Bank Guarantee (PBG) @3% of the total LOA value (for all the five rigs) shall be submitted by the successful bidder within 30 days from the date of issuance of LOA.
- 20.1 If there is an inordinate delay for delivery of either first lot or second lot of drilling rig packages, OIL at its discretion may not honor the "Letter of Award" and cancel the LOA/Purchase Order without any notice to the successful bidder.
- 21.0 The commissioning of each drilling rig package shall include complete Rig up (with all equipment along with supply of commissioning spares) at identified OIL drilling site as well as supervision of rig and its equipment for its smooth operation for a period of 30 (thirty) rig operating days after spudding of first well.
- 22.0 The supply of tendered equipment may involve assembling of various major units / components / assemblies / sub-assemblies whose OEMs may be different from the manufacturer of the tendered quoted product. Hence, bidders are required to furnish following details / undertakings along with the techno-commercial bid:
- a) Details of the manufacturer of major units / components / assemblies / sub-assemblies as detailed elsewhere in the tender, to be sourced / manufactured for assembling of final quoted product for supply to Oil India Limited.
 - b) All such major units / components / assemblies / sub-assemblies shall be inspected stage-wise at their respective OEM's / OES's works by Third Party Inspection agencies as detailed elsewhere in the tender. Bidder to provide address of such OEM's / OES's works.
 - c) The bidder should confirm acceptance and availability of required testing facilities as per International Standards at the place of final assembly of the drilling rig packages for inspection by Third Party Inspection agencies and Oil India Limited as detailed elsewhere in the tender.
- 23.0 Bidder must furnish the following undertakings from each of the Original Equipment Manufacturer(s) along with the techno-commercial bid for the listed items (ref. 11.12 of Annexure-AA).
- a) The OEM shall provide the maintenance / service / calibration facilities in India, for all the equipment to be supplied under the contract, as awarded by Oil India Limited.

- b) The bidder shall indicate the source of their bought-out items and the names of the original equipment / materials manufacturer for the major components. The OEM shall guarantee the lifetime supply (i.e., seven years in case of electronic equipment / items and ten years in case of mechanical equipment / items) of spares for all the equipment to be supplied under the contract, as awarded by Oil India Limited.
- c) For all the listed equipment (ref. 11.12 of Annexure-AA), bidder should submit an undertaking from OEM as mentioned – “The OEM undertakes to enter into Annual Maintenance Contract for lifetime (i.e., seven years in case of electronic equipment / items and ten years in case of mechanical equipment / items) for all the equipment to be supplied under the contract, as awarded by Oil India Limited.”

24.0 Spares:

Requirement of spares has been categorized into three types- Commissioning Spares, Mandatory Spares and Operational & AMC Spares.

- i) Commissioning Spares: The offer for each Rigs shall include cost of commissioning spares. Unutilized Commissioning spares, if any will be handed over to OIL at the end of installation/commissioning of each Rig. Commissioning spares will exclude High Speed Diesel.
- ii) Mandatory Spares: Mandatory spares is further segregated as Rig wise Mandatory Spares and Common Mandatory Spares. Rig wise mandatory spares as specified in the tender are to be supplied along with supply of each rig. However, common mandatory spares will be supplied with the first lot of two rigs, unless it is specified separately. Bidder(s) will have to quote for each of the specified mandatory spares and it will be considered for evaluation.
- iii) Operational Spares & AMC spares: Four (04) years operational spares & four (04) years AMC spares are to be quoted by the bidder based on the products offered by them. Such prices will remain valid for at least five (05) years from the date of commissioning of the first two (02) Rigs. Prices of these spares will not be considered for evaluation.

- 25.0 The drilling rigs will be put into operation in the states of Assam and Arunachal Pradesh which falls under Seismic Zone 5. The ambient temperature is Minimum 4-degree C and Maximum 47-degree C.
- 26.0 All the five (05) nos. of Rigs will be procured from a single source. Bidder(s) must note while submitting their offer.
- 27.0 Bidder(s) must submit unpriced bid along with their technical bid for evaluation by OIL. The unpriced bid should contain complete Technical and Commercial detail but without price. (i.e., along with the technical bid, bidder must submit duly filled **ANNEXURE-D1** or **ANNEXURE-D2**, whichever is applicable, excluding the prices. None of the prices are to be submitted in the unpriced bid.).
- 28.0 Unutilized Commissioning spares, if any will be handed over to OIL at the end of installation/commissioning of each Rig.
- 29.0 Bidder to note that the Draw works, Top Drive and Drilling Control System shall be of same make. Bidder to categorically confirm supply of Drilling Rigs with Draw works, Top Drive and Drilling Control System of the same make (which is offered and qualified against the BEC/BRC of the tender) in the event of an order on them.
- 30.0 Bidder to note that they will supply only those Make(s) of items/components/equipment against which they have qualified the BEC/BRC requirement, wherever applicable.
- 31.0 Bidder to note that the HSE points listed in **APPENDIX-AA-V** will be applicable for all services linked with this tender and subsequent LOA/PO/contract, including AMC. For AMC, separate contract(s) will be framed rig wise or lot wise on a later date after expiry of warranty period. Bidder to confirm adherence to the HSE points as listed in **APPENDIX-AA-V**.

CC: GENERAL NOTES TO BIDDERS

1.0 E-TENDER LOGIN ID AND PASSWORD:

- a) Bidders without having E-tender Login ID and Password should complete their online registration at least seven (7) days prior to the scheduled bid closing date and time of the tender. For online registration, Bidder may visit the OIL's E-tender site <https://etender.srm.oilindia.in/irj/portal>
- b) Necessary Login ID & Password will be issued by OIL only after submitting the complete online registration by the Bidder. In the event of late registration/incomplete registration by Bidder, OIL INDIA LIMITED shall not be responsible for late allotment of User ID & Password and request for bid closing date extension on that plea shall not be entertained by Company.

2.0 RESTRICTIONS ON PROCUREMENT FROM A BIDDER OF A COUNTRY SHARING LAND BORDER WITH INDIA:

Office Memorandum No. F.No.6/18/2019-PPD dated 23.07.2020 issued by Public Procurement Division under Department of Expenditure of Ministry of Finance will be applicable against the tender and thus bidder(s) must note that:

"Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services or works, only if the bidder is registered with the competent authority"

Such registration should be valid at the time of submission of bids and at the time of acceptance of bids.

For further details on above and format of certification to be submitted by the bidder, **APPENDIX-A1 & PROFORMA - A1** is to be referred.

3.0 POLICY TO PROVIDE PURCHASE PREFERENCE (LINKED WITH LOCAL CONTENT) (PPLC):

Bidders to note that Ministry of Petroleum & Natural Gas, Government of India implemented PPLC Policy to provide Purchase Preference (linked with local content) by notification no. Ref. FP-20013/2/2017-FP-PNG dtd. 17.11.2020 and its amendment issued from time to time. Clause on applicability of Purchase Preference (linked with local content) policy in the tender is furnished as **APPENDIX – A2** of the tender document. PP-LC Policy (including its latest modifications/amendments) as may be prevailing on the date of Price Bid Opening shall be applicable against this tender.

Under the PPLC policy the bidder must declare their percentage of local content in their technical bid unambiguously. In case bidder declares their local content in terms of range or in any other non-conclusive manner, the lowest value of bidder's local content shall be considered for determination of the class of the bidder.

Note: In case a bidder do not or fail to declare categorically their percentage of local content and their class as a supplier, such bidder will be treated as "Non-local Supplier" and no clarification shall be sought in this regard.

Bidders are requested to go through the policy and take note of the following while submitting their offer.

1. Certification and Verification

Bidder shall mandatorily submit adequate documentation as follows to establish their status as Class-I or Class-II local supplier:

(i) At bidding stage:

- a) Price Break-up:
 - The bidder shall provide the percentage of local content in the bid.
- b)
 - The bidder shall submit an undertaking from the authorised signatory of bidder having the power of Attorney alongwith the bid stating the bidder meets the mandatory minimum LC requirement and such undertaking shall become a part of the contract.

- In cases of procurement for a value in excess of Rs 10 crores, the undertaking submitted by the bidder shall be supported by a certificate from the statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practising chartered accountant (in respect of other than companies) giving the percentage of local content.
- However, in case of foreign bidder, certificate from the statutory auditor or cost auditor of their own office or subsidiary in India giving the percentage of local content is also acceptable. In case office or subsidiary in India does not exist or Indian office/ subsidiary is not required to appoint statutory auditor or cost auditor, certificate from practising cost accountant or practising chartered accountant giving the percentage of local content is also acceptable.

(ii) After Contract Award

- The bidder shall submit an undertaking from the authorised signatory of bidder having the power of Attorney alongwith the bid stating the bidder meets the mandatory minimum LC requirement and such undertaking shall become a part of the contract.
 - In cases of procurement for a value in excess of Rs 10 crores, the undertaking submitted by the bidder shall be supported by a certificate from the statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practising chartered accountant (in respect of other than companies) giving the percentage of local content.
 - However, in case of foreign bidder, certificate from the statutory auditor or cost auditor of their own office or subsidiary in India giving the percentage of local content is also acceptable. In case office or subsidiary in India does not exist or Indian office/ subsidiary is not required to appoint statutory auditor or cost auditor, certificate from practising cost accountant or practising chartered accountant giving the percentage of local content is also acceptable.
2. Each supplier shall provide the necessary local-content documentation to the statutory auditor, which shall review and determine that local content requirements have been met, and issue a local content certificate to that effect on behalf of procuring company, stating the percentage of local content in the good or service measured. The Auditor shall keep all necessary information obtained from suppliers for measurement of Local Content confidential.
 3. The Local Content certificate shall be submitted along with each invoice raised. However, the % of local content may vary with each invoice while maintaining the overall % of local content for the total work/purchase of the pro-rata local content requirement. In case, it is not satisfied cumulatively in the invoices raised up to that stage, the supplier shall indicate how the local content requirement would be met in the subsequent stages.
 4. As regards cases where currency quoted by the bidder is other than Indian Rupee, exchange rate prevailing on the date of tender shall be considered for the calculation of Local Content.
 5. The Procuring Company shall also have the authority to audit as well as witness production processes to certify the achievement of the requisite local content.

4.0 PUBLIC PROCUREMENT POLICY AND PURCHASE PREFERENCE TO MICRO AND SMALL ENTERPRISES:

Bidders to note that Govt. of India under Micro, Small and Medium Enterprises Development (MSMED) Act 2006, has proclaimed the Public Procurement Policy, 2012 with effect from 1st April, 2012 (and amendments issued time to time) in respect of procurement of goods and services, produced and provided by micro and small enterprises, by its Ministries, Departments and Public Sector Undertakings for promotion and development of Micro and Small Enterprises. In this regard, bidders are requested to take note of the following and to submit their offers accordingly.

- a) Categorisation and various criteria applicable to MSE bidders shall be guided by the Gazette notification no. CG-DL-E-26062020-220191 dated 26.06.2020 issued by Ministry of Micro, Small and Medium Enterprises. The existing enterprises registered under EM-Part-II or UAM till 30th June, 2020 shall continue to be valid only for a period up to the 31st day of March, 2021.

The bidder claiming as MSE status (MSE-General, MSE-SC/ST, MSE -Woman) against this tender has to submit following documents for availing the benefits applicable to MSEs:

- i. Udyam Registration No. with Udyam Registration certificate

OR

- ii. Proof of registration with District Industry Centres or Khadi& Village Industries Commission or Khadi& Village Industries Board or Coir Board or National Small Industries Corporation or Directorate of Handicrafts & Handloom or Udyog Adhar registration or registration with any other body specified by Ministry of MSME.

Note: In case bidding MSE is owned by Schedule Caste or Schedule Tribe entrepreneur, valid documentary evidence issued by the agency who has registered the bidder as MSE owned by SC/ ST entrepreneur/ Woman Entrepreneurs should also be enclosed.

- b) For availing benefits under Public Procurement Policy (Purchase preference), the interested MSE Bidders must ensure that they are the manufacturer/service provider of tendered item(s) and registered with the appropriate authority for the said item(s).

5.0 **Bidder to categorically confirm under which policy i.e. PP-LC or MSME, they want to avail the benefit and to submit requisite document/certificate in support of the same. The bids will be evaluated based on their declaration. Tenders involving eligible/qualified MSME Vendors as well as LC Vendors, preference regarding placement of order shall be accorded to MSME Vendors in line with Public Procurement Policy over PP-LC Policy.**

6.0 **FURNISHING FRAUDULENT INFORMATION/ DOCUMENT:**

If it is found that a Bidder has furnished fraudulent document/information, the Bid Security/Performance Security shall be forfeited and the party will be debarred for a period of 3(three) years from date of detection of such fraudulent act, besides the legal action. In case of major and serious fraud, period of debarment may be enhanced. In this regard, bidders are requested to submit an Undertaking as per **PROFORMA-A2** along with their offer failing which their offer shall be liable for rejection.

7.0 **INTEGRITY PACT:**

The Integrity Pact is applicable against this tender. OIL shall be entering into an Integrity Pact with the bidders as per format enclosed vide **PROFORMA - A3** of the tender document. This Integrity Pact proforma has been duly signed digitally by OIL's competent signatory. The proforma has to be returned by the bidder (along with the technical bid) duly signed (digitally) by the same signatory who signed the bid, i.e., who is duly authorized to sign the bid. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact has been signed by the bidder's authorized signatory who sign the Bid. If any bidder refuses to sign Integrity Pact or declines to submit Integrity Pact with the offer, their bid shall be rejected straightway.

OIL's Independent External Monitors at present are as under:

SHRI RUDHRA GANGADHARAN, IAS (Retd.),
Ex-Secretary, Ministry of Agriculture
E-Mail ID: rudhra.gangadharan@gmail.com

SHRI SUTANU BEHURIA, IAS (Retd.),
E-mail ID: sutanu2911@gmail.com

SHRI OM PRAKASH SINGH, IPS (Retd.)
Former DGP, Uttar Pradesh
E-mail: Ops2020@rediffmail.com

- 7.1 In case of a joint venture, all the partners of the joint venture should sign the Integrity Pact.

- 7.2 In the event of any dispute between the management and the contractor relating to those contracts where Integrity Pact is applicable, in case, both the parties are agreeable, they may try to settle dispute through mediation before the panel of IEMs in a time bound manner. If required, the organizations may adopt any mediation rules for this purpose. In case, the dispute remains unresolved even after mediation by the panel of IEMs, the organisation may take further action as per the terms and conditions of the contract.

8.0 **BID SECURING DECLARATION:**

No Bid Security /Earnest Money Deposit (EMD) is required to be submitted against the tender. Instead of EMD /Bid Security, all the bidders shall be required to sign a “Bid securing declaration” accepting that if they withdraw or modify their Bids during the period of validity, or if they are awarded the contract and they fail to sign the contract, or to submit a performance security before the deadline defined in the NIT/ Purchase order, they shall be suspended for the period of two (2) years. This suspension of two years shall be automatic without conducting any enquiry.

Bidders shall submit “Bid Securing Declaration” as per enclosed **PROFORMA – A4** alongwith their technical bids.

9.0 **PERFORMANCE SECURITY:**

Successful bidder shall be required to furnish a Performance Security equivalent to **THREE PERCENT (3%)** of total value of LOA (excluding taxes) within 30 days of receipt of LOA / notification of award. The performance security must be in the form of Bank Guarantee (**PROFORMA – A5**) or in the form of a Bank Draft / Cashier’s cheque / Banker’s cheque / NEFT / RTGS / Electronic fund transfer to designated account of OIL or Fixed Deposit Receipt (account OIL INDIA LIMITED) or irrevocable Bank Guarantee or irrevocable Letter of Credit(LC).

- A) The Bank Guarantee or irrevocable Letter of Credit (LC) for the purpose of Performance security should be from:

- i) Any schedule Indian Bank or any branch of an International bank situated in India and registered with Reserve Bank of India as scheduled foreign bank in case of domestic bidder, or
- ii) In case of foreign bidder, the bank guarantee can be accepted from any scheduled bank in India or from International bank who has its branch in India registered with Reserve Bank of India, or
- iii) Any foreign Bank which is not a Scheduled Bank in India, provided the Bank Guarantee issued by such Bank is counter-guaranteed by any Branch situated in India of any Scheduled Bank incorporated in India.

Bank Guarantee issued by a Bank in India at the request of some other Non-Scheduled Bank of India shall not be acceptable. Bank Guarantee issued by banks in India should be on non-judicial stamp paper of requisite value, as per the Indian Stamp Act, purchased in the name of the issuing banker.

- B) In case of Bank Guarantee, the Bank Guarantee issued by the Bank must be routed through SFMS platform as per following details:

- (i) MT760/MT760COV for issuance of Bank Guarantee
- (ii) MT 760/MT767COV for amendment of Bank Guarantee

The above message / intimation shall be sent through SFMS by the BG issuing Bank branch to HDFC Bank, Duliajan Branch, IFS Code–HDFC0002118; SWIFT Code-HDFCINBBCAL. Branch Address: HDFC Bank Limited, Duliajan Branch, Utopia Complex, BOC Gate, Jayanagar, Duliajan, Dibrugarh, PIN–786602. The vendor shall submit to OIL the copy of the SFMS message as sent by the issuing bank branch alongwith the original bank guarantee.

- C) In case of online payment, refund will be made in [INR] using the exchange rate prevailing as on the date of actual receipt of Performance Bank Guarantee amount. The refund amount shall not (in any case) exceed the amount actually received.
- D) The Performance Security shall be denominated in the currency of the contract.

- E) The Performance Security specified above must be valid for the entire duration of the Contract (including warranty period) and claim period should be valid for a minimum of 01 (one) year beyond the warranty period. The Performance Security will be discharged by COMPANY not later than 30 days following its expiry of claim period. In the event of any extension of the Contract period, Bank Guarantee should be extended by CONTRACTOR by the period equivalent to the extended period.
- F) The Performance Security shall be encashed by COMPANY on account of CONTRACTOR's failure to fulfil its obligations under the Contract and / or non-performance / unsatisfactory of the Contractor. Company shall not be required to proof any loss or damage on account of Contractor's non-performance / unsatisfactory performance
- G) The Performance Security will not accrue any interest during its period of validity or extended validity.
- H) Bank charges, if any for submission of performance security shall be on supplier's account.
- I) The validity of Bank Draft / Cashier's cheque / Banker's cheque should not be less than 03 (three) months at the time of submission to OIL.
- J) Non-submission of Performance Security as above by the successful Bidder shall lead to cancellation / termination of award, besides other penal actions as per OIL's Banning Policy. Bidders should undertake in their bids to submit Performance Security as stated above.
- K) In case Annual Maintenance Contract (AMC) is required and OIL intends to enter into a separate contract with the successful bidder for AMC, the Successful bidder must undertake to submit separate Performance Security against the AMC at the applicable rate & validity to be stipulated in the contract. **(3% of annualized contract value valid for three months beyond entire AMC execution period).**

10.0 Bid must be submitted online through OIL's e-procurement portal. Bid submitted in any other form will be rejected.

11.0 **DOCUMENT VERIFICATION CLAUSE:**

Oil India Limited (OIL) has engaged the following 09 (Nine) Independent Inspection Agencies for a period of 04 (four) years with effect from 06.05.2020 to verify and certify various documents required against BEC/BRC of the tender:

- I. M/s. RINA India Pvt. Ltd.
- II. M/s. Dr. Amin Controller Pvt. Ltd.
- III. M/s. Germanischer Lloyd Industrial Services GmbH (DNV GL- Oil & Gas)
- IV. M/s. TÜV SÜD South Asia Pvt. Ltd.
- V. M/s. IRCLASS Systems and Solutions Private Limited
- VI. M/s. Gulf Llyods Industrial Services (India) Pvt. Ltd.
- VII. M/s. TUV India Private Limited
- VIII. M/s. TÜV Rheinland (India) Pvt. Ltd.
- IX. M/s. Bureau Veritas (India) Private Limited

11.1 The Bidders have to get the various documents required against BEC/BRC of the tender verified and certified **(signed & stamped on all the pages)** by any one of the above Independent Inspection Agencies and submit the duly certified documents alongwith the Inspection Certificate **(PROFORMA-A6)** issued by the Inspection Agencies as part of their Technical Bid. It may be noted that the scope of inspection is primarily to verify the authenticity of the documents being submitted as part of the bid. All charges of the Third-party Independent Inspection Agencies towards verification of bidder's documents and certification thereof shall be borne by the respective bidders and payments on account of above inspection, verification and certification shall be made directly by the Bidder to the Inspection Agency(s). OIL will not be responsible for any payment dispute between Bidder and Third Party Inspection Agencies.

11.2 As mentioned above, Bidder(s) have to submit the verified documents and the duly certified Inspection Certificate by the Inspection Agencies along with the Technical Bids. Bid submitted with un-verified supporting documents shall not be normally considered. However, in case a bidder submits its bid alongwith all relevant supporting documents against BEC/BRC without getting all/some of them verified by the designated Independent Inspection agency, such bid can be provisionally considered provided it is accompanied by an Undertaking by the Bidder on their official letterhead to submit the duly verified copies/verification certificate within seven (7) days of actual bid opening. Company will neither send any reminder nor seek any clarification in this regard from such bidders, and the bid will be rejected outright if the bidder fails to submit the verified copies/verification certificate within seven (7) days of actual bid opening at its own risk and responsibility. If a bidder does not submit the undertaking towards submission of third party certification within 7 days from date of Bid Closing date, but certified document reaches GM-Materials, Materials Department, Oil India Limited, Duliajan – 786602, within the cut-off date of above seven (7) days, then such bids shall be considered.

11.3 The methodology of inspection/ verification of documents is broadly as under but not limited to:-

- I) It is obligatory on the part of the interested Bidders, who choose to participate against the tender, to understand the tender requirements in entirety and the requisite documents sought for in support of the Bid Rejection & Bid Evaluation Criteria (BEC/BRC) mentioned in the tender in particular. The Bidder must produce all the appropriate documents before any of the OIL's empaneled third-party certifying agencies for verification / certification. Neither OIL nor the third party certifying agency shall be held accountable in any manner regarding the choice of documents by the bidder for verification. Therefore, getting the appropriate documents inspected / verified by the agency in support of BEC/BRC clauses is the sole responsibility of the Bidder.
- II) The prospective bidder shall contact any of the empaneled inspection agencies. The agency shall go through the Tender Document, especially the requirements of BEC/BRC and list the documents to be verified. They shall depute their qualified / competent inspect or to the Bidder's premises to check the original documents and certify the copies which the bidder shall submit along with their bids. OIL will reserve the right to ask the inspection agencies to verify the documents with source, if required at no extra cost to OIL. Verification of documents by OIL's empaneled third party agency shall not automatically make the bidder eligible for award of contract.
- III) Verification of documents (but not limited to) are normally categorized asunder:

A) General Requirement:

- Check Bidder's PAN Card
- Check Bidder's GST Certificate
- Check ITR of company—last three years (minimum)
- Check Bidder's Certificate of Incorporation—Domestic Bidder.

B) Additional Documents (If applicable against the tender):

- Joint Ventures Agreements—To Double-check with JV Partners
- Consortium Agreements—To Double-check with Consortium Partners
- Holding/ Parent/Subsidiary Company – To check the notarized Share Holding pattern

C) Technical Criteria

- To check Experience Proof
- To Check the Completion Certificates – Letter of Appreciations of proper Execution
- Reference contract verification and true copy verification
- To check Original Work Order / Contract Copy
- To check any other document(s), if called for vide BEC/BRC of the Tender.

D) Financial Criteria

- Check and verify Audited Balance Sheet/CA certificate – Turnover & Net Worth.
- Check Notarization validity if any
- To check the Line of Credit, if incorporated in the tender

Note: Documents submitted subsequently by the bidder on account of clarification sought by OIL pertaining to their offer are not necessarily required to be verified and certified by Independent Inspection Agencies.

However, OIL reserves the right to ask the bidder to verify and certify such subsequently submitted documents through the same Independent Inspection Agency who had verified and certified the documents submitted by the bidder along with the bid. In the event, OIL ask for verification of such documents, it would be obligatory for the bidder to submit the said documents duly verified and certified (signed & stamped on all the pages) by the Independent Inspection Agency, otherwise such subsequently submitted documents shall not be considered for evaluation.

11.4 Contact details of the Independent Inspection Agencies

Sl.No.	Name of Independent Inspection Agency	Contact E-mail ID
i	M/s. RINA India Pvt. Ltd.	ssd@rina.org Andrea.Vattuone@rina.org
ii.	M/s. Dr. Amin Controllers Pvt. Ltd.	rkjain@rcaindia.net info@rcaindia.net
iii.	M/s. Germanischer Lloyd Industrial Services GmbH (DNVGL-Oil & Gas)	mangesh.gaonkar@dnvgl.com
iv.	M/s. TÜV SÜD South Asia Pvt. Ltd.	Jaimin.Bhatt@tuv-sud.in sanjaykumar.singh@tuv-sud.in Pankaj.Narkhede@tuv-sud.in Ajit.Yadav@tuv-sud.in
v.	M/s. IRCLASS Systems and Solutions Private Limited	abhishek.singh@irclass.org pradeep.bansal@irclass.org Asim.Hajwani@irclass.org Amit.Ketkar@irclass.org industrial_services@irclass.org
vi.	M/s. Gulf Lloyds Industrial Services(India)Pvt. Ltd.	contact@gulflloyds.com bbhavsar@gulflloyds.com inspection@gulflloyds.com gulflloyds.india@gmail.com
vi.	M/s. TUV India Private Limited	salim@tuv-nord.com delhi@tuv_nord.com
viii.	M/s. TÜV Rheinland (India) Pvt. Ltd.	Shailesh.Deotale@ind.tuv.com ravi.kumar@ind.tuv.com rupeshkumar.singh@ind.tuv.com Neeraj.Chaturvedi@ind.tuv.com
ix.	M/s. Bureau Veritas (India) Private Limited	udit.chopra@bureauveritas.com vishal.sapale@bureauveritas.com dinesh.sukhramani@bureauveritas.com p.sridhar@bureauveritas.com hariprasad.jhawar@bureauveritas.com amit.shaw@bureauveritas.com business.support@bureauveritas.com labhanshu.sharma@bureauveritas.com pramodkumar.yadav@bureauveritas.com sonal.lad@bureauveritas.com bvindia.corporate@in.bureauveritas.com

12.0 Bidders must ensure that their bid is uploaded in the system before the tender closing date and time.

13.0 Bidders are requested to examine all instructions, forms, terms and specifications in the bid. Failure to furnish all information required as per the bid or submission of offers not substantially responsive to the bid in every respect will be at the bidders risk and may result in rejection of its offer without seeking any clarifications.

- 14.0 To ascertain the substantial responsiveness of the bid, OIL reserves the right to ask the bidder for clarification in respect of clauses covered under BRC also and such clarifications fulfilling the BRC clauses in toto must be received on or before the deadline given by OIL, failing which the offer will be summarily rejected. However, bidder(s) must note that there should not be any additional financial involvement arising out of such post tender clarifications.
- 15.0 The items covered in this Tender shall be used by Oil India Limited in the PEL/ML areas and hence Nil rate of Customs Duty towards import (for foreign bidders) and concessional GST @5% (for foreign & indigenous bidder) will be applicable as per Govt. Policy in vogue.

In the event of an order on indigenous bidder, OIL will issue Project Authority Certificate (PAC) under Deemed Export Benefit Scheme (as per Govt. Policy in vogue), where import content is declared by the bidder for availing Custom Duty benefit on the import content. The PAC will be issued in the name of the indigenous bidder including the name of the sub-vendors as declared in their offer or as per the format issued by competent authority at time of placement of order.

Note: Successful bidder shall arrange to provide all necessary documents (invoice etc.) to OIL for applying Essentiality Certificate on receipt of request from OIL or at least **45 days** prior to their readiness for despatch, whichever is earlier. Further, successful bidder shall affect dispatch only on receipt of relevant certificates/shipment clearance from OIL, failing which all related liabilities shall be to supplier's account.

- 16.0 The tender will be governed by "General Terms & Conditions" for e- Procurement as per Booklet No. MM/GLOBAL/E-01/2005 for E-procurement (ICB Tenders) including Amendments & Addendum to "General Terms & Conditions" for e-Procurement.

However, if any of the tender clause mentioned in any part of the tender except Booklet No. MM/GLOBAL/E-01/2005 contradicts with clauses of Booklet No. MM/GLOBAL/E-01/2005, those tender clauses will prevail over the clauses in Booklet No. MM/GLOBAL/E-01/2005.

Additionally, services involved against the tender shall also be governed by terms & conditions stipulated in **GTC-2 (General Conditions of Contract)** of this tender.

17.0 DIGITAL SIGNATURE CERTIFICATE

To participate in OIL's E-procurement tender, bidders should have a legally valid digital certificate of Class 3 with Organizations Name and Encryption certificate as per Indian IT Act from the licensed Certifying Authorities operating under the Root Certifying Authority of India (RCAI), Controller of Certifying Authorities (CCA) of India (<http://www.cca.gov.in>). Digital Signature Certificates having "Organization Name" field as "Personal" are not acceptable.

17.1 Digital Signature Certificate comes in a pair of Signing/verification and Encryption/decryption certificate. Bidder should have both the Signing/verification and Encryption/Decryption certificate for Signing and encryption, decryption purpose respectively. The driver needs to be installed once, without which the DSC will not be recognized. While participating on e-Tendering, the DSC token should be connected to your system.

17.2 Encryption certificate is mandatorily required for submission of bid. In case bidder created response with one certificate (using encryption key) and bidder change his Digital Signature Certificate then old certificate [Used for encryption] is required in order to decrypt his encrypted response for getting the EDIT mode of the response. Once decryption is done, bidder may use new DSC certificate for uploading and submission of their offer. It is the sole responsibility of the bidder to keep their DSC certificate properly.

17.3 In case of loss of the certificate, OIL INDIA LIMITED is not responsible.

- 18.0 Bids are invited online under **SINGLE STAGE TWO BID SYSTEM**. Bidders must prepare the **TECHNO-COMMERCIAL BID (UNPRICED)** as well as the **PRICED BID** separately and upload both these bids in OIL's e-procurement portal at the designated fields separately assigned. Please note that no price details should be furnished in the Technical (i.e. Unpriced) bid. The "Unpriced Bid" shall contain all techno-commercial details except the prices/costs. The rate and amount columns in the unpriced technical bid must be kept blank. The

“Price Bid” shall contain the price schedule as per the price bid format. Bidder not complying with above submission procedure will be rejected.

18.1 Please do refer the User Manual provided on the portal on the procedure ‘How to create Response for submitting offer’.

18.2 The bidder has to submit both the “TECHNO-COMMERCIAL UNPRICED BID” and “PRICED BID” through electronic form in the OIL’s e-Tender portal within the Bid Closing Date and Time stipulated in the e-Tender portal. Details of prices as per the price Bid format / Commercial bid shall be uploaded as attachment in the Attachment Tab **“Notes and Attachments”** only. Any offer not complying with above submission procedure will be rejected as per Bid Rejection Criteria mentioned in the tender.

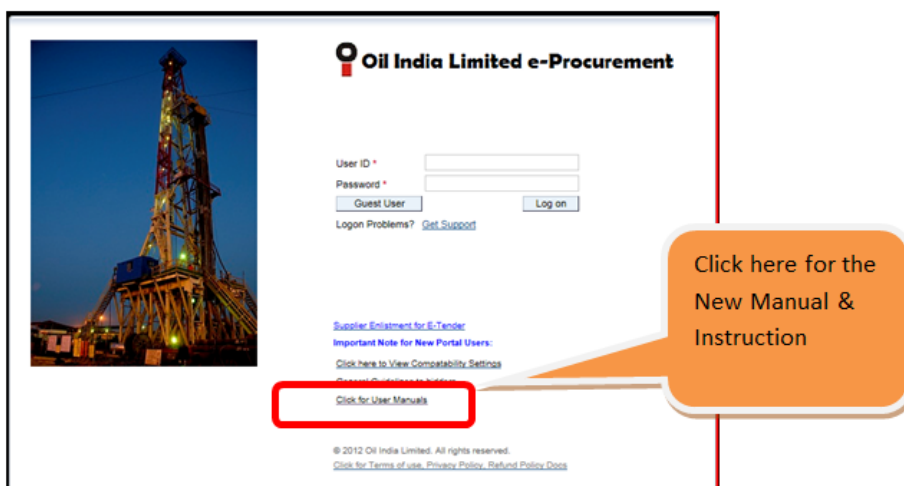
Notes and Attachments

→ Only Price Details Should Be Uploaded

Technical attachments

→ All technical bid documents except price details

Please do refer **“NEW INSTRUCTION TO BIDDER FOR SUBMISSION”** for the above two points and also please refer **“New Vendor Manual (effective from 12.04.2017)”** available in the login Page of the OIL’s E-tender Portal.



18.3 In Technical Bid opening, only Technical Rfx will be opened. Therefore, the bidder should ensure that **“TECHNO-COMMERCIAL UNPRICED BID”** should contain details as mentioned in the technical specifications as well as BEC/ BRC and upload the same in the Technical RFX Response-> User - > Technical Bid. **No price should be given in above Technical Rfx, otherwise the offer will be rejected.** Please go through the help document in details before uploading the document and ensure uploading of technical bid in the Technical RFX Response-> User - > Technical Bid only. The “Price Bid” shall contain the price schedule as per the price bid format. Details of prices as per Bid format / Commercial bid will be uploaded as Attachment under “Notes & Attachments”.

18.4 Priced bids of only those bidders will be opened whose offers are found to be techno-commercially acceptable.

18.5 For convenience of the qualified Bidders and to improve transparency, the rates/cost quoted by bidders against OIL’s e-tenders shall be available for online viewing by such Bidders whose price bids are opened by Company. A Bidder can view item-wise rates/costs of all other such peer bidders against the tender immediately after price bid opening, if the e-tender is floated by Company with PRICE CONDITION. In case the Price-Bid is invited by Company through attachment from under “Notes & Attachment” (i.e. NO PRICE CONDITION), Bidders must upload their detailed Price-Bid as per the prescribed format under “NOTES & ATTACHMENT”, in addition to filling up the “TOTAL BID VALUE” tab taking into account the cost of all individual line items and other applicable charges like freight, tax, duties, levies etc. under NO PRICE condition (i.e. Price Bid in attachment

form), the “Total Bid Value” as calculated & quoted by the Bidder shall only be shared amongst the eligible bidders and Company will not assume any responsibility whatsoever towards calculation errors/omissions therein, if any. Notwithstanding to sharing the “Total Bid Value” or the same is whether filled up by the Bidder or not, Company will evaluate the cost details to ascertain the inter-se-ranking of bidders strictly as per the uploaded attachment and Bid Evaluation Criteria only. Online view of prices as above shall be available to the Bidders only upto seven days from the date of Price-Bid opening of the e-tender.

19.0 AMENDMENT OF BID DOCUMENTS:

19.1 At any time prior to the deadline for submission of bids, the Company may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Bid Documents through issuance of Corrigendum(s)/Addendum(s).

19.2 The Corrigendum(s)/ Addendum(s) will be uploaded in OIL’s E-Tender Portal in the Tab “Technical Rfx” and under External Area - “Amendments” folder. The Company may, at its discretion, extend the deadline for bid submission. Bidders are expected to take the Corrigendum(s)/ Addendum(s) into account in preparation and submission of their bid. Bidders are to check from time to time the E-Tender portal [“Technical RFX” Tab and under the folder “Amendments”] for any amendments to the bid documents before submission of their bids. No separate intimation shall be sent to the Bidders and Bidder(s) must keep themselves updated.

20.0 Quantity of Individual item may be increased or decrease at the time of final placement of order. The minimum FOB/FCA charges in case of partial order for reduced quantity/enhanced quantity shall have to be indicated by the bidder. In case, this is not indicated specifically, the charges quoted would be pro-rata calculated and the same will be binding on the bidder.

21.0 Please mention clearly in your quotation the Net. Weight, Gross Weight & Volume, Indian Agent's Name and its Commission, Payment Terms, Ocean Freight/Air Freight Charges, Port of Loading, Delivery period, Country of origin with manufacturer's name, etc.

22.0 For the imported items, the bidder must confirm to submit, “Certificate of Origin” issued only by “Chambers of Commerce” alongwith the shipping documents.

23.0 Any deviation(s) from the tender specification should be clearly highlighted specifying justification in support of deviation.

24.0 Original Bid Closing Date shall be considered by OIL for evaluation of BRC Criteria in case of any extension of the bid closing date.

25.0 Indian Bidders shall indicate the following in their offer:

25.1 Ex Works unit and total price as per price bid format including packing, forwarding and insurance; all costs as well as duties and taxes paid or payable on components and raw materials incorporated or to be incorporated in the goods, inspection, testing and loading on transport carrier etc.

25.2 The quoted price shall be deemed to be inclusive of all taxes and duties except “Goods and Services Tax” (hereinafter called GST) (i.e. IGST or CGST and SGST/UTGST applicable in case of interstate supply or intra state supply respectively and GST compensation Cess, if applicable)

25.3 Built in CIF value of import (ref. 15.0 for benefits under deemed export) for raw material and components incorporated or to be incorporated in the goods and included in quoted price. The bidder shall provide description of such material, quantity, rate, value etc.

25.4 Inland transportation charges from dispatch point to designated Project Site/dump area/dump yard including **loading and unloading** of materials. The prices should be inclusive of all taxes, duties, levies etc.

- 26.0 Foreign Bidders shall indicate the following in their offer:
- 26.1 Bidders shall submit their unit & total prices on FOB – International Port of Shipment, and C&F – Port of entry, India basis as detailed out in the Price Schedule. The request for different price basis is merely to facilitate the comparison of bids and will not in any way limit the OIL's right to contract on different terms.
- 26.2 Bidder shall also quote for Ocean Freight charges (including stowage charges) upto the port of entry, India, in the price schedule. The request for separate FOB Price and Ocean Freight is merely to facilitate the comparison of bids.
- 26.3 All shipments of material and containerised cargo shall be made by suitable vessels certified for seaworthiness and complying with National/ International safety regulations.
- 26.4 Seller shall inform the shipping details (Vessel details, Estimated Time of Arrival etc.) immediately on receipt of Bill of Lading. Detention & Demurrages, if any, due to early arrival of vessel, shall be to bidder's account.
- 27.0 Both Indian bidder and Foreign bidder must note that no trans-shipment en-route is permitted. However, under exceptional circumstances, trans-shipment may be allowed with prior consent of OIL. No charges shall be payable for such transshipment and consequent handling/storage of the goods.
- 28.0 In case of placement of order, OIL reserves the right to convert the order from FOB Port of Shipment to C&F Kolkata term considering the ocean freight quoted by the party in their offer. In case the order is converted to C&F Kolkata Port, the performance security amount shall also be enhanced considering the quoted ocean freight charges.
- 28.1 Bidder should confirm in their quotation that in case of C&F order, their nominated freight forwarder should provide Delivery Order under Single Window facility having office of local agent in India at Kolkata and offer **14 days free detention time** of containers at discharging port.
- 29.0 In case of Indian bidders, they are required to indicate both Ex-works as well as FOR Destination price by road. OIL reserves the right to place order on FOR (despatching station) or FOR (destination) terms. Offered **freight** rates should be kept valid **throughout the delivery period**.
- In case of placement of order on FOR Despatching station basis, OIL reserves the right to convert the order from FOR Despatching station to FOR Destination terms considering the freight quoted by the party in their offer. In case the order is converted to FOR Destination, the performance security amount shall also be enhanced considering the quoted freight charges.
- 30.0 In case a Foreign Bidder's offer is based on certain component sourced within India, additional terms & condition specified elsewhere in the bid document shall be applicable in respect to such components.
- 31.0 Currency once quoted will not be allowed to be changed. OIL shall not be compensating for any exchange rate fluctuation.
- 32.0 In case any payment receipt of the foreign bidder against the order is subject to tax deduction at source in India, the Bidder shall quote their prices gross of Indian income tax. i.e., inclusive of Indian Income Tax at the applicable prevailing rate as per Indian Income Tax rules. Owner/Purchaser shall deduct at source the tax as applicable while making payments against each invoice for the services in India. Certificate for Tax Deducted at Source (TDS) shall be provided to the Seller.
- 33.0 **PAYMENT TERMS:** 80% payment of supply value will be released against supply and balance 20% after satisfactory installation & commissioning at site along with the installation & commissioning charges after adjustment of liquidated damages, if any. Bidders must confirm acceptance of the payment term while quoting. Payment towards pre-despatch inspection and training will be released after successful completion of pre-despatch inspection & training and against submission of invoice. Payment against AMC charges shall be released against submission of Invoices on quarterly basis after completion of specific quarters.

Note:

- i) Request for payment/part payment to third party (i.e., other than the party on whom the order has been placed) will not be entertained by OIL under any circumstances. The offers stipulating payment/part payment to such third party will be considered as non-responsive and such offers will be rejected.
- ii) Payment will be processed rig wise.
- iii) Any other payment term other than above shall be considered as Advance Payment for which bidder(s) must refer to Clause no. 33.1 of part: CC of Annexure-A.

33.1 Clauses on Advance Payment:

- A) Request for advance payment shall not be normally considered. However, depending on merit and at the sole discretion of OIL, advance payment may be agreed at an interest rate of 1% above the prevailing Bank rate (CC rate) of State Bank of India compounding on quarterly basis from the date of payment of the advance till recovery/refund.
- B) Advance payment if agreed to by the Company shall be paid only against submission of an acceptable Bank Guarantee [**PROFORMA-A7**] whose value should be equivalent to the amount of advance plus the amount of interest estimated by OIL on the basis of contractual delivery period without further reference.
- C) Bank Guarantee shall be valid for 3 (three) months beyond the delivery period incorporated in the order and same shall be invoked in the event of Seller's failure to execute the order within the stipulated delivery period.
- D) In the event of any extension to the delivery date, seller shall enhance the value of the bank guarantee to cover the interest for the extended period and also shall extend the validity of bank guarantee accordingly.
- E) Advance paid, if any along with the interest amount (as mentioned above) shall be recovered from supplier's first bill/invoice.
- F) In no case, total value of advance payment shall exceed 10% of the purchase order value towards supply.

34.0 **LIQUIDATED DAMAGE:**

- 34.1 Time will be of the essence of the contract.
- 34.2 Liquidated damages shall be evaluated per rig basis.
- 34.3 In the event of the Seller's default in maintaining the agreed delivery schedule set out in the order, OIL shall have the right to cancel the order at any time after expiry of scheduled delivery date without any reference to the Seller and make alternative arrangement at the discretion of OIL in which case extra expenditure involved, will be recoverable from the Seller and OIL shall not be responsible towards such cancellation or any damage that may be incurred by the Seller. The decision of OIL shall be final and binding on the Seller.
- 34.4 As an alternative to above, OIL reserve the right to accept the materials but, the Seller shall be liable to pay liquidated damages @ 0.5% per week or part thereof of the value of the goods in respect of which default in delivery takes place subject to a maximum of 7.5 %. Should there be default on the part of the Seller for more than 15 Weeks from the scheduled date to complete the delivery or to complete the installation / commissioning & Training (wherever applicable) successfully, OIL shall have the right, in addition to the provisions under Clause 34.3 to invoke the Performance Security without causing any notice to the Seller to this effect.
- 34.5 The applicable GST on the Liquidated Damage shall have to be borne by the seller. Accordingly, the Liquidated Damage shall be recovered from the seller along with applicable GST.

35.0 Bidder to sign and submit completely filled up Evaluation Matrix for BEC (**Annexure-B1**), Technical Specification & Scope of Work (**Annexure-AA2**) and Commercial Checklist (**Annexure-C**) alongwith their technical bid.

36.0 **LANGUAGE OF BIDS**

The bid as well as all correspondence and documents relating to the bid exchanged between the Bidder and the Company shall be in English language, except that any printed literature may be in another language provided it is accompanied by an official and notarized English translated version, which shall govern for the purpose of bid interpretation.

If the supporting documents for establishing the Bid Evaluation Criteria, such as duly audited Balance Sheet, Purchase Order, Inspection Release Note etc., are not in English language, then the English translation copy of the same shall also be furnished duly certified from any one of the following:

- a) Official of Indian Embassy/High Commission/Consulate General situated in the country where language has been translated.
- b) Official of Embassy/High Commission/Consulate General of the country where language has been translated, in India.

In case any printed literature furnished by the bidder in another language and is accompanied by an English translation, in which case, for the purpose of interpretation of the bid, the English translation shall govern.

37.0 **APPLICABILITY OF BANNING POLICY OF OIL INDIA LIMITED:**

Banning Policy dated 6th January, 2017 as uploaded in OIL's website will be applicable against the tender (and order in case of award) to deal with any agency (bidder/contractor/supplier/vendor/service provider) who commits deception, default, fraud or indulged in other misconduct of whatsoever nature in the tendering process and/or order execution processes. Applicability of the policy shall include but not limited to the following in addition to other actions like invoking bid security/performance security/cancellation of order etc. as deemed fit and as mentioned elsewhere in the tender:

- a) BACKING OUT BY BIDDER WITHIN BID VALIDITY
- b) BACKING OUT BY SUCCESSFUL BIDDER AFTER ISSUE OF LOA/ORDER/CONTRACT
- c) NON/POOR PERFORMANCE AND ORDER/CONTRACT EXECUTION DEFAULT

The bidders who are on Holiday/Banning/Suspension list of OIL on due date of submission of bid/ during the process of evaluation of the bids, the offers of such bidders shall not be considered for bid opening/evaluation/award. If the bidding documents were issued inadvertently/downloaded from website, the offers submitted by such bidders shall also not be considered for bid opening/evaluation/Award of Work.

38.0 **IMPORTANT NOTES:** Bidders shall take note of the following important points while participating in OIL's e-procurement tender:

38.1 Bid should be submitted online in OIL's E-procurement site up to 11.00 Hrs. (IST) (Server Time) on the date as mentioned and will be opened on the same day at 14.00 Hrs. (IST) at the office of the GM-Materials in presence of the authorized representatives of the bidders.

38.2 Bidders are advised in their own interest to ensure that their bids are uploaded in system well ahead of the bid closing date and time of the bid.

39.0 **COMPLIANCE OF THE COMPETITION ACT, 2002:** The bidder shall strictly comply with the provisions of the Competition Act, 2002, more particularly, Section-3 of the Act. Any violation the provisions of the Act shall attract penal action under the Act.

40.0 **LOCAL CONDITIONS:** It is imperative for each Bidder to be fully informed themselves of all Indian as well as local conditions, factors and legislation which may have any effect on the execution of the work covered under the Bidding Document. The bidders shall be deemed, prior to submitting their bids to have satisfied themselves of all the aspects covering the nature of the work as stipulated in the Bidding Document and obtain for themselves all necessary information as to the risks, contingencies and all other circumstances, which may influence or affect the various obligations under the Order. No request will be considered for

clarifications from the Company (OIL) regarding such conditions, factors and legislation. It is understood and agreed that such conditions, factors and legislation have been properly investigated and considered by the Bidders while submitting the Bids. Failure to do so shall not relieve the Bidders from responsibility to estimate properly the cost of performing the work within the provided timeframe. Company (OIL) will assume no responsibility for any understandings or representations concerning conditions made by any of their officers prior to award of the Order. Company (OIL) shall not permit any Changes to the time schedule of the Order or any financial adjustments arising from the Bidder's lack of knowledge and its effect on the cost of execution of the Order.

41.0 **LIMITATION OF LIABILITY:** Notwithstanding any other provisions herein to the contrary, except only in cases of wilful misconduct and/or criminal acts,

- (a) Neither the Supplier nor the Company (OIL) shall be liable to the other, whether in Contract/Purchase Order, tort, or otherwise, for any consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs.
- (b) Notwithstanding any other provisions incorporated elsewhere in the Contract/Purchase Order, the aggregate liability of the Supplier in respect of this Contract/Purchase Order, whether under Contract/Purchase Order, in tort or otherwise, shall not exceed **100%** of the Contract/Purchase Order Price, provided however that this limitation shall not apply to the cost of repairing or replacing defective equipment by the Supplier, or to any obligation of the Supplier to indemnify the Company with respect to Intellectual Property Rights.
- (c) The Company shall indemnify and keep indemnified the Supplier harmless from and against any and all claims, costs, losses and liabilities in excess of the aggregate liability amount in terms of clause (b) above.

42.0 **SUBSEQUENTLY ENACTED LAWS:** Subsequent to the date of bid closing, if there is a change in or enactment of any law or change in application or enforcement or interpretation of existing law by any governmental authority or public body, which results in addition/ reduction in cost to Contractor on account of the operation contemplated under the Contract, the Company/the Contractor shall reimburse the Contractor/pay the Company for such additional/reduced costs actually incurred/saved by the Contractor, subject to the submission of documentary evidence by the Contractor/the Company.

43.0 **CONSEQUENTIAL DAMAGE:** Except as otherwise expressly provided, neither party shall be liable to the other for special, indirect or consequential damages resulting from or arising out of the contract, including but without limitation, to loss or profit or business interruptions, howsoever caused and regardless of whether such loss or damage was caused by the negligence (either sole or concurrent) of either party, its employees, agents or sub-contractors.

44.0 **INTELLECTUAL PROPERTY:** Neither the Company nor the Bidder/Supplier nor their personnel, agents nor any sub-contractor shall divulge to any one (other than persons designated by the party disclosing the information) any information designated in writing as confidential and obtained from the disclosing party during the course of execution of the works so long as and to the extent that the information has not become part of the public domain. This obligation does not apply to information furnished or made known to the recipient of the information without restriction as to its use by third parties or which was in recipient's possession at the time of disclosure by the disclosing party. Upon completion of the works or in the event of termination pursuant to the provisions of the Contract, the Bidder/Supplier shall immediately return to the Company all drawings, plans, specifications and other documents supplied to the Contractor by or on behalf of the Company or prepared by the Contractor solely for the purpose of the performance of the works, including all copies made thereof by the Contractor.

45.0 **WILFUL MISCONDUCT:** Shall mean intentional disregard of good and prudent standards of performance or proper conduct under the contract / order/ tender with knowledge that it is likely to result in any injury to any person or persons or loss or damage of property of the Company or Third Party.

46.0 **PACKAGING:** The Seller, wherever applicable shall after proper painting, pack and crate all goods for sea/air/road/rail transportation in a manner suitable to tropical humid climatic region in accordance with

the internationally accepted practices and in such a manner so as to protect it from damage and deterioration, in transit by sea or air or road or rail and during storage at the storehouse. The Seller shall be held responsible for all damages due to improper packing. The Seller shall ensure sizing or packing of all oversized consignments in such a way that availability of carrier and/or road/rail route is properly taken into consideration. Seller shall comply with the Packing, Marking and Shipping Instructions and Special Packaging Requirement as per this Bidding Document. All items must have their respective identification marks painted /embossed on them.

47.0 ROAD DESPATCH

- a) In the event of an order other than FOR Destination terms, the material will be required to despatch through OIL's approved transporters (which will be specified in the order) on "Door Delivery" basis.
- b) For orders placed on FOR Destination basis, the material will be required to despatch through reputed Bank approved transporters only on Door Delivery basis. In case OIL is required to collect the material from transporters Godown, extra expenditure incurred thereof will be recovered from the Bidder/seller.
- c) The SELLER shall ensure with Transport Company the delivery of materials within a reasonable transit period. SELLER shall also obtain from transporter, particulars of Lorry Number, Transporter's Challan Number, destination of lorry (if transhipment is involved), Transporter's Agent at destination, if any, etc. and intimate same to OIL.

48.0 SHORT SHIPMENTS: Seller should thoroughly check all items in the packing before effecting shipment. If any item(s) are found short packed in sound boxes on examination at project site, Seller shall be responsible to supply short packed items free of charge on receipt of advice from Purchaser. Seller shall also be responsible to bear the import duty levied by Indian Customs on such short packed items.

49.0 CLAUSES RELATED TO GST

- 49.1 For the purposes of levy and imposition of GST, the expressions shall have the following meanings:
 - (a) GST - means any tax imposed on the supply of goods and/or services under GST Law.
 - (b) Cess – means any applicable cess, existing or future on the supply of Goods and Services as per Goods and Services Tax (Compensation to States) Act, 2017.
 - (c) GST Law - means IGST Act 2017, CGST Act 2017, UTGST Act, 2017 and SGST Act, 2017 and all related ancillary Rules and Notifications issued in this regard from time to time.
- 49.2 The rates quoted by the bidders shall be inclusive of all taxes, duties and levies. However, bidders are required to provide separately the rate and amount of all types of taxes, duties and levies. In case, the quoted information related to various taxes, duties & levies subsequently proves wrong, incorrect or misleading, OIL will have no liability to reimburse the difference in the duty/ tax, if the finally assessed amount is on the higher side and OIL will have to right to recover the difference in case the rate of duty/ taxes finally assessed is on the lower side. Further, bidders have to clearly show the amount of GST separately in the Tax Invoices. Further, it is the responsibility of the bidders to make all possible efforts to make their accounting / IT system GST compliant in order to ensure availability of Input Tax Credit (ITC) to Oil India Ltd.
- 49.3 Offers without giving any of the details of the taxes (Including rates and amounts) as specified above will be considered as inclusive of all taxes including GST. When a bidder mentions taxes as extra without specifying the rates & amount, the offer will be loaded with maximum value towards taxes received against the tender for comparison purposes. If the bidder emerges as lowest bidder after such loading, in the event of order on that bidder, taxes mentioned by OIL on the Purchase Order/ Contracts will be binding on the bidder.
- 49.4 Bidders are required to pass on the benefit arising out of introduction of GST, including seamless flow of Input Tax Credit, reduction in Tax Rate on inputs as well as final goods by way of reduction of price as contemplated in the provision relating to Anti-Profiteering Measure vide Section 171 of the CGST Act, 2017. Accordingly, for supplies made under GST, the bidders should confirm that benefit of lower costs has been passed on to OIL by way of lower prices/taxes and also provide details of the same as applicable. OIL reserves the right to examine such details about costs of

inputs/input services of the bidders to ensure that the intended benefits of GST have been passed on to OIL.

49.5 Oil India Ltd. shall declare the value of free issue of materials and services, if any, involved in the execution of the order. The Contractor should consider the same while working out the GST liability, if any. Further in cases where GST is leviable on any facilities provided by OIL and used by bidders and the consideration for which is recovered by OIL in the form of reduction in the invoice raised by bidders then OIL will raise GST invoices on such transactions and the same will be reimbursed by bidders.

49.6 **When Input tax credit is available for Set Off**

Evaluation of L-1 prices shall be done based on Quoted price after deduction of Input Tax Credit (ITC) of GST, if available to OIL. OIL shall evaluate the offers on the basis of the quoted rates only and any claim subsequently by the bidders for additional payment/liability shall not be admitted and has to be borne by the bidders.

When Input tax credit is NOT available for Set Off

Evaluation of L-1 prices shall be done based on Quoted price only. OIL shall evaluate the offers on the basis of the quoted rates only and any claim subsequently by the bidders for additional payment/liability shall not be admitted and has to be borne by the bidders

49.7 Bidders agree to do all things not limited to providing GST compliant Tax Invoices or other documentation as per GST law relating to the supply of goods and/or services covered in the instant contract like raising of and /or acceptance or rejection of credit notes / debit notes as the case may be, payment of taxes, timely filing of valid statutory Returns for the tax period on the Goods and Service Tax Network (GSTN), submission of general information as and when called for by OIL in the customized format shared by OIL in order to enable OIL to update its database etc. that may be necessary to match the invoices on GSTN common portal and enable OIL to claim input tax credit in relation to any GST payable under this Contract or in respect of any supply under this Contract.

49.8 In case Input Tax Credit of GST is denied or demand is recovered from OIL by the Central / State Authorities on account of any non-compliance by bidders, including non-payment of GST charged and recovered, the Vendor/Supplier/Contractor shall indemnify OIL in respect of all claims of tax, penalty and/or interest, loss, damages, costs, expenses and liability that may arise due to such non-compliance. OIL, at its discretion, may also withhold/recover such disputed amount from the pending payments of the bidders.

50.0 In no case OIL shall bear any additional liability for the arrangement between bidder and its suppliers/sub-vendors for complying with local content.

The price quoted by the bidder shall be deemed to be inclusive of all taxes and duties including "Goods and Services Tax" (hereinafter called GST) (i.e. IGST or CGST and SGST/UTGST applicable in case of interstate supply or intra state supply respectively and GST compensation Cess if applicable). However, the GST amount and GST Rate considered should be expressly provided in the quote. Any subsequent liability arising on account of underquoting of the GST rate and/or GST amount in the bid shall be solely to the bidder's account.

In case there is a requirement to obtain registration by the bidder under the Indian laws (including but not limited to GST) for carrying out the transaction proposed under the tender/contract, bidder shall be the sole responsible person for obtaining such registration. Further, any cost associated with obtaining any such registration or complying with Indian laws (including but not limited to GST) shall be borne by the bidder solely. Any additional tax burden (including interest and penalty etc.) arising out of non-compliance of this requirement by the bidder will be to the bidder's account.

51.0 **TAX COLLECTIBLE AT SOURCE (TCS):**

Tax Collectible at Source (TCS) applicable under the Income-tax Law and charged by the SUPPLIER shall be payable by OIL along with consideration for procurement of goods / materials / equipment. If TCS is collected by the SUPPLIER, a TCS certificate in prescribed Form shall be issued by the SUPPLIER to OIL within the statutory time limit.

Payment towards applicable TCS u/s 206C (IH) of Income Tax Act, 1961 will be made to the supplier provided they are claiming it in their invoice and on submission of following undertaking alongwith the invoice stating that:

- a. TCS is applicable on supply of goods invoiced to OIL as turnover of the supplier in previous year was more than Rs.10 Cr.
- b. Total supply of goods to OIL in FY ...exceeds Rs.50 Lakh and
- c. TCS as charged in the invoice has already been deposited (duly indicating the details such as challan No. and date) or would be deposited with Exchequer on or before the due date and
- d. TCS certificate as provided in the Income Tax Act will be issued to OIL in time.

However, Performance Security deposit will be released only after the TCS certificate for the amount of tax collected, is provided to OIL. Supplier will extend the performance bank guarantee (PBG), wherever required, till the receipt of TCS certificate or else the same will be forfeited to the extent of amount of TCS, if all other conditions of Purchase order are fulfilled.

The above payment condition is applicable only for release of TCS amount charged by supplier u/s 206C (I H) of Income tax Act, 1961

52.0 SUBMISSION OF TAX RESIDENCY CERTIFICATE (TRC), NO PERMANENT ESTABLISHMENT(PE) CERTIFICATE & FORM 10F:

- A) In accordance with Income Tax Act, 1961 Foreign bidders shall undertake in their Technical bid that in the event of placement of order on them, they shall submit below documents within 15 days from the date of issue of Purchase order. The documents are required to be furnished by OIL to Income Tax Department for complying with the requirements for making remittances to non-residents as per Income Tax Act, 1961 (as amended from time to time):
 - i. Tax Residency Certificate(TRC)
 - ii. Form No. 10F (**PROFORMA-A8**)
 - iii. No Business Connection or Permanent Establishment Certificate (**PROFORMA-A9**)
- B) Payment to Foreign supplier shall be released only after receipt of the above documents. Any delay in submission of Tax Residency Certificate (TRC), Form No. 10 F and/or PE certificate within specified time may lead to the Income Tax Department directing OIL to deduct tax at a higher rate than at which it may otherwise have directed. Such increased tax liability shall be recovered from the Foreign Supplier.
- C) In addition to above particulars, the Foreign supplier should also provide any other information as may be required later for determining the taxability of the amount to be remitted to the non-resident. Further, the foreign supplier shall be liable to intimate the subsequent changes (if any) to the information submitted against any of the above particulars, along with full details.

DD :: ADDITIONAL NOTES TO THE BIDDER

1.0 BIDDER TO ADHERE:

The bidder shall be deemed to have examined the complete Bid Document including technical specifications, terms & conditions, all attachments & annexure thereto and taken due cognizance of the contents to their full satisfaction prior to submitting Bid. Any lack of information shall not relieve the Seller in any way of its responsibility to fulfil obligations under the purchase order/contract in entirety.

2.0 EFFECTIVE DATE OF CONTRACT/ ORDER:

Unless otherwise specified in the contrary, the date of LOA will be the start of the Contract/Order for all practical purposes.

3.0 CONFIDENTIAL INFORMATION:

The Seller/Bidder shall treat all designs, drawings, specifications, data or information supplied by OIL (whether written or verbal) as confidential and shall use its best endeavours to ensure that such design, drawings, data or information is not divulged to any third party, except with the consent of OIL, where necessary for the purpose of performance of its obligation and subject to similar undertakings being obtained from such third parties to treat such design, drawings, data or information in like confidence other than designs, drawings, data or information which at the time of proposed disclosure are within the public knowledge or in the Seller's possession.

4.0 PATENT AND OTHER RIGHTS:

4.1. The Seller shall fully indemnify OIL against any action, claim or demand, costs and expenses arising from or incurred by reason of any infringement or alleged infringement of any letter, patent, design, trademark or name, copy right or other legally protected rights in respect of any plant, work, materials to be supplied or any arrangement, system or method of using, fixing or working to be employed by the Seller.

4.2. In the event of any claim or demand being made or action brought against OIL in respect of any of the aforesaid matters, OIL shall notify the Seller thereof as soon as possible and Seller shall conduct with the assistance of OIL if necessary, but at his own expense, all negotiation for the settlement of such matter and any legal proceeding, litigation/arbitration involved or which may arise there from. Notwithstanding above, OIL reserves the right to initiate action against the seller.

5.0 ASSIGNMENT:

5.1. The Seller shall not transfer or assign the consequent Contract or any part thereof without the prior consent in writing from OIL. Any permitted transfer/assignment or subletting shall not relieve the Seller of any of his obligations, which might have arisen before such permission was given.

5.2. The Seller shall not sublet the consequent Contract or any part thereof without the prior consent in writing from OIL. Any permitted subletting shall not relieve the Seller of any of his obligations under the contract/purchase order and shall be wholly responsible for compliance of the terms of the Contract/Purchase Order.

6.0 TAXES, DUTIES & LEVIES:

6.1. DOMESTIC SUPPLIER:

(a) Domestic Seller shall be responsible for all taxes/duties/ licence fee etc. incurred until the delivery of goods to the Purchaser. However, GST (Goods & Service Tax) as applicable on the finished product shall be reimbursed by the Purchaser.

(b) GST at applicable rate (s) shall be payable for the supplies to be made against this purchase order/ contract. However, supplier is required to take note of the Anti-Profiteering clause provisioned in GST and raise/submit supply invoice(s) incorporating the following details:

- (i) **OIL-Provisional GSTIN:**
- (ii) **GST Registration Details of Supplier:**
- (iii) **Item-wise HSN Code:**
- (iv) **Applicable Rate of GST:**

(v) Total amount of benefit passed on to OIL due to reduction in rate of Tax (if so) or from Input Tax Credit by way of commensurate reduction in Prices under Anti Profiteering clause:

In addition to above, the Supplier must submit an undertaking to OIL certifying that the benefit accrued to them on account of reduction in tax rate(s) or from Input Tax Credit has been entirely passed on to OIL under anti-profiteering provision of GST Act, 2017

- (c) For the purposes of levy and imposition of GST, the expressions shall have the following meanings:
- (i) "GST" means any tax imposed on the supply of goods and/or services under GST Law.
 - (ii) "Cess" means any applicable cess, existing or future on the supply of Goods and Services as per Goods and Services Tax (Compensation to States) Act, 2017.
 - (iii) "GST Law" means IGST Act 2017, CGST Act 2017, UTGST Act, 2017 and SGST Act, 2017 and all related ancillary Rules and Notifications issued in this regard from time to time.
- (d) Vendor/Supplier/Contractor is required to pass on the benefit arising out of introduction of GST, including seamless flow of Input Tax Credit, reduction in Tax Rate on inputs as well as final goods by way of reduction of price as contemplated in the provision relating to Anti-Profiteering Measure vide Section 171 of the CGST Act, 2017. Accordingly, for supplies made under GST, the Vendor/Supplier/Contractor must confirm that benefit of lower costs has been passed on to OIL by way of lower prices/taxes and must also provide details of the same as applicable. OIL reserves the right to examine such details about costs of inputs/input services of the Vendor/Supplier/Contractor to ensure that the intended benefits of GST have been passed on to OIL.
- (e) Vendor/Supplier/Contractor agrees to do all things but not limited to providing GST compliant Tax Invoices or other documentation as per GST law relating to the supply of goods and/or services covered in the instant contract like raising of and/or acceptance or rejection of credit notes/ debit notes as the case may be, payment of taxes, timely filing of valid statutory Returns for the tax period on the Goods and Service Tax Network (GSTN), submission of general information as and when called for by OIL in the customized format shared by OIL in order to enable OIL to update its database etc. that may be necessary to match the invoices on GSTN common portal and also for claiming input tax credit in relation to any GST payable under this Contract or in respect of any supply under this Contract.
- (f) In case Input Tax Credit of GST is denied to OIL or demand is recovered from OIL by the Central State Authorities on account of any non-compliance by Vendor/Supplier/Contractor, including non-payment of GST charged and recovered, the Vendor/Supplier/Contractor shall indemnify OIL in respect of all such claims of tax, penalty and/or interest, loss, damages, costs, expenses and liability that may arise due to such non-compliance. OIL, at its discretion, may also withhold/recover such an amount demanded and recovered by the authorities/ state authorities from the pending payments of the Vendor/Supplier/Contractor.
- (g) In case of ICB tender, wherever OIL issues Project Authority Certificate to domestic Seller for availing duty-free import of raw material and component, any variation in the custom duty within the contractual completion period of the purchase order/contract shall be to Purchaser's account on CIF value of import declared by the Seller in its Bid.
- (h) All taxes, stamp duties and other levies for the services including installation/commissioning, Training etc. shall be to the Seller's account.
- (i) Income Tax on the value of the Services rendered by the Seller in connection with installation /commissioning, training etc. shall be deducted at source from the invoices at the appropriate rate under the I.T. Act & Rules from time to time.
- (j) Tax deduction certificate shall be issued by Purchaser for the Tax deducted at source as per provision of Act.
- (k) GST TDS shall be applicable for as per the provisions of the CGST Act 2017

13.2 FOREIGN SUPPLIER:

- a) All taxes, duties and levies imposed outside India shall be the responsibility of the Seller and charges thereof are included in the item rates and shall be to the Seller's account.
- b) All taxes, duties and levies imposed inside India on the ordered materials/goods shall be borne by the Purchaser. However, taxes, levies as may be payable in India on services, if included any in the order/contract, including the installation & Commissioning, training etc. shall be to Seller's account.
- c) Income Tax on the value of the Services rendered by the Seller in connection with installation, commissioning, training etc. shall be deducted at source from the invoices at the appropriate rate under the I.T. Act & Rules from time to time.
- d) Tax deduction certificate shall be issued by Purchaser for the Tax deducted at source as per provisions of Act.
- e) As per Income Tax Act, 1961 Foreign bidders should submit (along with their technical bid) following particulars, which are required to be furnished by OIL to Income Tax Department for complying with the requirements for making remittances to non-residents as per Income Tax Act, 1961 (as amended from time to time):
 - (i) Whether the non-resident has a Fixed Place Permanent Establishment (PE) or a Dependent Agency PE in India, in terms of the Double Taxation Avoidance Agreement (DTAA) between India and his country of tax residence through which the non-resident carries on business activities in relation to its engagement by OIL and if, yes, address of the Fixed Place PE or name & address of the Dependent Agent?
 - (ii) Whether by carrying on activities in relation to its engagement by OIL, the non-resident constitutes an Installation/Construction PE or a Service PE in India in terms of the DTAA between India and his country of tax residence?
 - (iii) If the non-resident has PE in India, whether the remittances to be made to him under his engagement by OIL are attributable to such PE?
 - (iv) If the remittances to be made to the non-resident under his engagement by OIL are attributable to a PE which it has in India, what quantum of the profits resulting to the non-resident from his engagement by OIL, can be said to be attributable to the role played by the PE, and the basis of arriving at such quantum?
 - (v) If no part of the remittances to be made to the non-resident under his engagement by OIL is attributable to a PE which it has in India, what are the reasons for the same?
 - (vi) Non-resident's complete address (not necessarily in India), e-mail address. phone number with International Dialling code.
 - (vii) If the non-resident has an Indian Income Tax Permanent Account Number (PAN), what is that PAN?
 - (viii) Country of tax residence of the non-resident supported by a TRC issued by the Government of country or specified territory to the effect that the person named therein is a resident of that country or specified territory.
 - (ix) In accordance with Rule 21AB of the Income-tax Rules, 1962, along with the TRC, the non-resident shall also furnish the requisite information in the prescribed "Form 10F".
 - (x) A declaration as to the country which can be regarded as the non-resident's principal place of business. This could be the same as his country of tax residence or different depending on facts.

- (xi) Whether the non-resident is constituted as a company, a partnership firm, or any other form of business organization.
- f) In view of above and in accordance with Income Tax Act, 1961 Foreign bidders shall undertake in their Technical bid that in the event of placement of order on them, they shall submit below documents within 15 days from the date of issue of Purchase order. The documents are required to be furnished by OIL to Income Tax Department for complying with the requirements for making remittances to non-residents as per Income Tax Act, 1961 (as amended from time to time):
- Tax Residency Certificate (TRC)
 - Form No. 10F
 - No Business Connection or Permanent Establishment Certificate
- g) Payment to Foreign supplier shall be released only after receipt of the above documents. Any delay in submission of Tax Residency Certificate (TRC), Form No. 10F and/or PE within the specified time may lead to the Income Tax Department directing OIL to deduct tax at a higher rate than at which it would otherwise have been deducted. Such increased tax liability shall be recovered from the Foreign Supplier.
- h) In addition to above particulars, the Foreign supplier should also provide any other information as may be required later for determining the taxability of the amount to be remitted to the non-resident. Further, the Foreign supplier shall be liable to intimate the subsequent changes (if any) to the information submitted against any of the above particulars, along with full details.

7.0 CHANGE IN LAW:

- 7.1. In the event of introduction of any new legislation or any change or amendment or enforcement of any Act or Law, rules or regulations of Government of India or State Government(s) or Public Body which becomes effective after the tender closing date and which results in increase in rate of taxes and duties on the supply of goods/services to PURCHASER under the PURCHASE ORDER (other than personnel and Corporate taxes), the SUPPLIER shall be indemnified for any such increased taxes and duties by the PURCHASER subject to the production of documentary proof to the satisfaction of the PURCHASER to the extent which directly is attributable to such introduction of new legislation or change or amendment as mentioned above and adjudication by the competent authority & the courts wherever levy of such taxes / duties are disputed by PURCHASER.
- 7.2. Similarly, in the event of introduction of new legislation or any change or amendment or enforcement of any Act or Law, rules or regulations of Government of India or State Government(s) or Public Body which becomes effective after the tender closing date and which results in any decrease in the rate of taxes and duties on the supply of goods/services to PURCHASER, (other than personnel and Corporate taxes), the SUPPLIER shall pass on the benefits of such reduced cost, taxes or duties to the PURCHASER, to the extent which is directly attributable to such introduction of new legislation or change or amendment as mentioned above.
- 7.3. All taxes & duties (except where otherwise expressly provided in the Purchase Order) as may be levied/ imposed in consequences of execution of the Services or in relation thereto or in connection therewith as per the Acts, Laws, Rules, Regulations in force on the tender closing date, shall be to SUPPLIER's account. Any increase/decrease in the rate of such duties, taxes after the tender closing date, but within the contractual completion/mobilization date as stipulated in the PURCHASE ORDER will be to the account of PURCHASER.
- 7.4. Any increase in the rate of taxes & duties after the delivery completion/ mobilization date or during the extended period will be to the SUPPLIER's account, where delay in completion /mobilization period is attributable to the SUPPLIER. However, any decrease in the rate of taxes and duties after the delivery completion/ mobilization date will be to PURCHASER's account.
- 7.5. The prices given in the Price Bid are based on the applicable tariff as indicated by the SUPPLIER. In case this information subsequently proves to be wrong, incorrect or misleading, PURCHASER will have no liability to reimburse/pay to the SUPPLIER the excess duties, taxes, fees, if any finally levied / imposed by the concerned authorities. However, in such an event, PURCHASER will have the right to recover the difference in case the rate of duty/tax finally assessed is on the lower side.

- 7.6. Notwithstanding the provision contained in clause 7.1 to 7.4 above, the Purchaser shall not bear any liability in respect of:
- (i) Personal taxes on the personnel deployed by Purchaser, his sub-contractor, Agents etc.
 - (ii) Corporate taxes and Fringe benefit tax in respect of Supplier and all of their sub- contractors, agents etc.
 - (iii) Other taxes & duties including Customs Duty, and GST in addition to new taxes etc. in respect of sub-contractors, vendors, agents etc. of the Supplier.
 - (iv) Any liability on the Seller, which was accrued under the old law or contract, which the Contractor is obligated to pay either to the PURSHASER or to the Government Authority.
- 7.7. The above provisions would be applicable only in case of variation in rate of taxes and duties on supply of goods/services to PURCHASER and not applicable on taxes and duties on input (goods and services).
- 7.8. Any claim or reduction on account of change in law shall be accompanied with undertaking that the provisions of anti-profiteering clause under GST Act have been complied with.

8.0 TRANSFER OF TITLE AND RISK OF LOSS:

8.1. For Indigenous Material(s):

The transfer of property and risk in Indigenous Material(s) shall be deemed to take place as follows:

- a) For despatch on FOB Despatch Station basis: On handing over the Material(s) to the carrier against receipt of clean Railway Receipt/Truck or Lorry Receipt and such receipt having been handed over to OIL.
- b) For delivery on DDP Destination basis: On receipt of the Material(s) by OIL at the destination station.

8.2. For Imported Material(s):

The transfer of property and risks in Imported Material(s) shall be deemed to take place as follows:

- a) For FOB/FCA deliveries: On handing over the Material(s) to the carrier and issue of clean Bill of Lading/Airway Bill (except for freight to pay) and its transmission to OIL.
- b) For CIF/C&F deliveries: Transfer of title and risk of loss passes to OIL when delivered on board the ship by vendor who pays the transportation cost upto the destination port or to the designated destination airport (as per INCOTERMS).

9.0 LIMITATION OF LIABILITY:

Notwithstanding any other provisions except only in cases of wilful misconduct and/or criminal acts;

- a) Notwithstanding any other provisions herein to the contrary, except only in cases of willful misconduct and/or criminal acts and/or criminal negligence, neither the SELLER nor the PURCHASER shall be liable to the other, whether in Contract, tort, or otherwise, for any consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided however that this exclusion shall not apply to any obligation of the SELLER to pay Liquidated Damages to the COMPANY and/or COMPANY's right to forfeit the Performance Bank Guarantee(s) in terms of the contract.
- b) Notwithstanding any other provisions incorporated elsewhere in the purchase order/contract, the aggregate liability of the Seller in respect of this contract, whether under Contract, in tort or otherwise, shall not exceed 100% of the Contract price, provided however that this limitation shall not apply to the cost of repairing or replacing defective equipment by the Seller, or to any obligation of the Seller to indemnify the Purchaser with respect to Intellectual Property Rights or liquidated damage or Performance Bank Guarantee.
- c) Purchaser shall indemnify and keep indemnified Seller harmless from and against any and all claims, costs, losses and liabilities in excess of the aggregate liability amount in terms of clause (b) above.

- d) The consideration or object of the purchase order/contract/agreement must remain lawful all the time till completion of successful execution. Consideration or object of the purchase order/contract/agreement is lawful unless -

- it is forbidden by law; or
- is of such nature that, if permitted, it would defeat the provisions of any law; or
- is fraudulent; or involves or implies, injury to the person or property of another; or
- the Court regards it as immoral, or opposed to public policy;

In each of these cases, the consideration or object is said to be unlawful and such purchase order/contract/agreement of which the consideration or object is unlawful is void and cannot be enforced.

10.0 INDEMNITY AGREEMENT:

- 10.1. Except as provided hereof, Bidder/Seller agrees to protect, defend, indemnify and hold Purchaser harmless from and against all claims, suits, demands and causes of action, liabilities, expenses, cost, liens and judgments of every kind and character, without limit, which may arise in favour of Seller's employees, agents, sellers and sub-sellers or their employees on account of bodily injury or death, or damage to personnel/property as a result of the operations contemplated hereby, regardless of whether or not the said claims, demands or causes of action arise out of the negligence or otherwise, in whole or in part or other faults.
- 10.2. Except as provided hereof, Purchaser agrees to protect, defend, indemnify and hold Seller harmless from and against all claims, suits, demands and causes of action, liabilities, expenses, cost, liens and judgments of every kind and character, without limit, which may arise in favour of Purchaser's employees, agents, sellers and sub-sellers or their employees on account of bodily injury or death, or damage to personnel/property as a result of the operations contemplated hereby, regardless of whether or not said claims, demands or causes of action arise out of the negligence or otherwise, in whole or in part or other faults.

11.0 TRANSIT INSURANCE:

- 11.1. All goods supplied under the consequent purchase order shall be fully insured in the freely convertible currency against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery.
- 11.2. The Seller shall ensure that in effecting despatch of materials, the primary responsibility of the shipper/carriers/transporter for safe movement is always retained so that the Purchaser's interests are fully safeguarded and are in no way jeopardized. The Seller shall furnish the cost of materials against each shipment/consignment.
- 11.3. Against Purchase Orders placed on overseas/foreign Supplier, where shipment is on FOB/FCA or CFR basis, marine insurance shall be the responsibility of the Purchaser. The Supplier/Seller shall send OIL information of the proposed shipment/consignment well in advance by e-mail/courier to enable OIL to take necessary action for the marine/air/transit insurance of the shipment/consignment. Any failure by the Vendor to do so shall place the consignment at the Vendor's risk. However, in case the delivery is on CIF/CIP terms, the marine insurance is to be arranged and paid for by the Seller naming the Purchaser as beneficiary.
- 11.4. Against Purchase Orders placed on domestic/indigenous Suppliers, where delivery is on FOB Despatch Station basis, the transit insurance from FOB point onwards shall be arranged and borne by the Purchaser. The Supplier/Seller shall send OIL information of the proposed shipment/consignment in OIL's web site www.oil-india.com (Under Vendor Category > Transit Declaration. Any failure by the Vendor to do so shall place the consignment at the Vendor's risk. However, in case of delivery on DDP Destination basis, transit insurance shall be arranged and paid by the Seller naming the Purchaser as the beneficiary.
- 11.5. Purchase orders against which the transit/marine insurance is to be arranged by OIL, the Seller/Supplier must comply the following, failing which the entire risk & responsibility pertaining to the shipment/consignment shall be to Seller's account:
- (a) Overseas/Foreign Supplier: The Seller shall notify OIL's Shipping Office at Kolkata, India in advance per e-mail/courier all information on the proposed shipment/consignment for Purchaser to take necessary action for the marine/air/transit insurance.

- (b) Shipment must be made under deck In the event of Seller's inability to ship the material under deck, Purchasers prior concurrence must be obtained for shipping consignment over deck and all details must be faxed to Purchaser and the port consignee for arranging insurance accordingly.
- (c) Domestic/Indigenous Supplier: Seller shall notify the despatch details to Purchaser immediately and update the consignment details in OIL's website www.oil-india.com (Under for Vendor -> Transit Declaration).

11.6. Seller must notify the shipment/despatch details to Purchaser immediately.

12.0 PROGRESS REPORT:

- 12.1. In consistent with the agreed terms, upon demand from Purchaser, upon receipt of purchase order, the Seller shall submit a time schedule for all key events during the execution of the order, so as to monitor the progress.
- 12.2. Based on the above time schedule the Seller shall furnish a monthly report on the progress of the order to the Purchaser. Without assuming any obligations, Purchaser may review the progress from time to time and advise the seller to take necessary corrective action to improve and to have a catch-up programme any time, if found not satisfactory.
- 12.3. Notwithstanding the above, if Seller fails to catch up and does not make satisfactory progress, Purchaser can notify the Seller in writing for take necessary action to make it good. If the Seller does not comply with the notice, the Purchaser shall be at liberty to take over the job and get it done by alternative source at the risk and cost of Seller.

13.0 LANGUAGE:

All related documents as well as subsequent correspondences between the Seller and the Purchaser shall be in English language only.

14.0 REPEAT ORDER:

Purchaser reserves the right to place repeat order or extend the ordered quantity against any/all items within the currency of the purchase order up to 50% of the original ordered quantity on same terms & conditions and rate(s) not exceeding the original ordered rate(s).

15.0 SUB-CONTRACTS / ASSIGNMENT:

- 15.1. Subcontracting/assigning to third parties shall not take place either in whole or in part without the prior written consent of the Purchaser, which the Purchaser may grant or deny as per its discretion and violation of same shall entitle the Purchaser to cancel the order in whole or in part and claim damages.
- 15.2. Purchase Order shall be issued in the name of bidder only and no request for issuance of the Purchase Order to a third party shall be entertained.

16.0 TIME IS THE ESSENCE OF PURCHASE ORDER/CONTRACT:

The time and the date of delivery/completion as stipulated in the contract/purchase order shall be deemed to be the essence of the contract/purchase order.

17.0 DELIVERY:

17.1. For Foreign Bidders only:

In case of Imported Material, the foreign Supplier shall make shipment only after prior approval of the OIL's Shipping Office at Kolkata, email: oilcalsh@oilindia.in. Demurrage, if any, on account of not obtaining approval from OIL, prior to shipment, will be seller accounts.

Prior to shipment, Supplier is required to furnish Commercial Invoice for OIL to complete import formalities. Also, the supplier shall arrange to obtain shipment clearance prior to shipment of materials from Head-Kolkata Branch, Oil India Limited, 15A, Hemanta Basu Sarani, Kolkata-700001, E-Mail: oilcalsh@oilindia.in. The supplier shall affect shipment only on receipt of shipment clearance from OIL, failing which all related liabilities shall be to supplier's account.

17.1.1. Delivery shall be deemed to have been made in case of FOB/FCA purchase order/contract, when the goods have been loaded on board of the designated vessel or aircraft at the designated port or place of shipment, securely packed and unless otherwise determined, shall be deemed to be the date of the relative Bill of Lading or Airway Bill. The date of Bill of Lading (excluding the freight forwarder nomination time) shall be considered as the date of delivery for overseas/foreign Sellers.

17.1.2. However, in case of CFR/CIF/CIP purchase order/contract, the date of IGM (Import General Manifesto) shall be considered as the date of delivery for overseas/foreign Sellers.

17.2. **For Indian Bidders only:**

Requisite Certificate for claiming concessional GST, wherever applicable shall be obtained by OIL from competent authority after receipt of supplier's invoice. Suppliers are requested not to dispatch ordered materials without receiving such Certificates from OIL, failing which liabilities, if any, shall be to supplier's account.

In case of indigenous purchase order on domestic Supplier, delivery shall be deemed to have been completed based on the order terms as under:

- (a) FOB Despatching Station basis: The date of LR/ GR/ RR/ Airway Bill/Courier Dockets (as applicable) shall be considered as the date of delivery.
- (b) DDP Destination basis: The date of receipt of goods at designated site/destination by the Purchaser or its authorised Consultant/Representative shall be considered as the date of delivery.
- (c) All FOC (Free of Cost) items or Warranty replacement items must be supplied on DDP (Delivery Duty Paid) up to Destination basis without any cost to OIL.

18.0 INGREDIENTS DISCLOSURE:

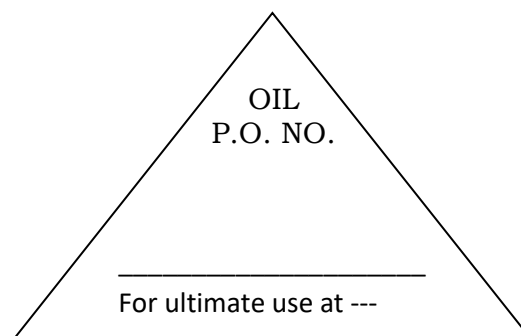
- (a) If any of the items ordered constitute or contain "hazardous or toxic chemicals" or "hazardous substances" or flammable or hazardous "petroleum products" or "dangerous goods" as defined by International Air Transport Association (IATA) or State or local law, rule or regulation, Seller shall provide at the time of delivery all required notices and information and approval from OIL before shipment. Seller agrees to maintain such information current and shall provide Buyer with any amended, altered or revised information on a timely basis. Seller warrants that the goods supplied under this Agreement do not contain any substance whose use is prohibited under International Air Transport Association (IATA) or State or local law, rule or regulation.
- (b) Prior to and with the shipment of the goods purchased, Seller agrees to furnish to Buyer sufficient warning and notice in writing (including appropriate placarding and labels on goods, containers, packing and vehicles used for shipment) of any "hazardous substance" which is an ingredient or a part of any of the goods, together with such special handling instructions as may be necessary to advise Buyer and third parties, including transportation carriers and Buyer's employees, as to the degree of care and precaution that will best prevent bodily injury or property damage in the handling, transportation, processing, use, recycling or disposal of the goods.

19.0 PACKING & MARKING OF GOODS/EQUIPMENT:

- 19.1. Packing of goods must be sufficiently robust to withstand multiple handling during transit for delivery to their final destination so that contents do not get damaged. Protection of the plant and equipment against corrosion or deterioration must be given special attention. In case of overseas Suppliers, the packing should be sea-worthy/air-worthy.
- 19.2. Machined steel and iron parts are to be heavily greased/varnished as prevention against rust.
- 19.3. In the case of internal combustion engines, compressors and similar equipment, internal parts are to be sprayed with an inhibitor or water splitting preservative and all openings should be suitably covered with tape/cap to prevent ingress of water.
- 19.4. Boxes/ Packing cases containing electrical/ electronic equipment are to be waterproof lined.

- 19.5. All items must have their respective identification marks painted/ embossed on them.
- 19.6. Crates or boxes should have a list of items contained therein secured to the exterior by means of an enveloping piece of tin sheet nailed to the wood. A duplicate list should also be included inside the crate with the contents.
- 19.7. Items prone for pilfering should be packed in boxes and not in bags.
- 19.8. The Seller shall be responsible for damage of goods either in full or in part and for corrosion and/or deterioration of the plant and equipment during transit due to inadequate/insufficient packing or due to noncompliance with the above Para Nos. 19.1 to 19.4 depending upon the nature of items and as such shall be obligated to repair or replace the damaged goods or plant or equipment in full or in parts thereof, at free of cost to OIL within a reasonable period of time.
- 19.9. Items that can be packed in bundles must be secured with strong wires or bands near each end and at regular intervals along the length to prevent splaying and ensure rigidity. Bundles must be suitably tagged using labels which are securely fastened by the ties clearly stencilled with mark, number and port mark.
- 19.10. Bundles or pieces must be adequately painted and marked as per item specifications.
- 19.11. In case of tubular, the weight of each bundle should not exceed 2 MT.
- 19.12. All spares are to be labelled with purchaser's order number and item number in addition to seller's part number, if any.
- 19.13. Electrical equipment must be suitable for use in humid and tropical climate and be specially treated / finished to prevent deterioration / corrosion. Insulation is to be non-hygroscopic and preferably vacuum dried and pressure impregnated.
- 19.14. Each box/crate/pallet/piece should be clearly marked on atleast two sides with OIL's Purchase order number, consignee name and address, consignment note number, package number and total number of packages.
- 19.15. Shipping Mark in case of foreign order to be despatched by sea/air:

Please put the following shipping mark clearly on each package / piece:



In addition to the shipping mark as shown above, packages must be marked on two sides with net and gross weights in kilograms and measurements in centimetres and country of origin. For pieces over 1 MT these dimensions must be marked on all sides to facilitate identification in case of shipping marks becoming obliterated.

All packages, wherever possible, should have a label placed inside bearing a clear impression of the external, mark, number and port mark.

- 19.16. Shipment confirmation by overseas/foreign Suppliers:
The foreign Seller shall advise the Purchaser by email or fax immediately after the shipment is effected with details of name of shipping line and vessel/airline and flight number, date of shipment, port of shipment, number and date of Bill of Lading/AWB, terms of delivery, number of packages, weight and volume of consignment and brief description of goods.

19.17. Road Despatch by domestic Suppliers:

19.17.1. In the event of an order other than DDP Destination terms on indigenous Seller, the materials shall be despatched through OIL's approved transporter/carrier (which will be specified in the order) on "Door Delivery" basis.

19.17.2. For orders placed on DDP Destination basis on indigenous Seller, the materials shall be despatched through reputed Bank approved transporters/carriers only on Door Delivery basis. In case OIL is required to collect the material from transporters godown, extra expenditure incurred thereof will be recovered from the Seller.

19.18. Rail Despatch by domestic Suppliers:

In case of Rail despatch, the indigenous Seller shall be fully responsible for arranging the required railway wagons/rake. Tubular consignment will be despatched preferably in open type wagons. In case of despatch by other wagons, prior approval of OIL is to be taken. Height of the wagons should not exceed 4.6 metres.

19.19. Weight and Size Limitation of Packages:

Category	Length (Mtrs.)	Width (Mtrs.)	Height (Mtrs.)	Capacity (MT)
Truck	5.185	1.98	1.98	9
Normal Trailer	10.98	2.44	2.44	18
Semi Low Bed Trailer	10.98	3.05	3.05	20
Low Bed Trailer	6.71	3.05	3.81	18

Above dimensional restrictions must not be violated without prior approval from the Purchaser. The finished packing should be in the form of a box under the limited dimensions.

20.0 TRANSPORTATION:

20.1. OVERSEAS/FOREIGN SUPPLIER:

- a) Where the Seller is required to undertake delivery of goods on FOB terms, documentation, handling & inland transportation upto putting the ordered goods on the board at port of loading shall be arranged and paid by the Seller. The total order value includes all such costs/FOB charges etc. For the orders issued on FOB/FCA terms, OIL reserves the right to convert the order from FOB/FCA Port of export to C&F Kolkata term considering the ocean/air freight quoted by Seller in their offer. In such case, seller shall submit enhanced performance security amount considering the quoted ocean freight charges as notified by OIL.
- b) Where the Seller is required to undertake the delivery of goods on CFR or CIF basis, documentation, handling & transportation of goods upto the port of discharge in the country of destination, as specified in the purchase order, shall be arranged and paid by the Seller. The total order value includes all such associated costs upto the port of discharge in the country of destination.
- c) In case of air-shipment of sundry consignments (gross weight upto 100Kg), OIL may nominate its Air-cargo Consolidation Service Provider to receive such duly packed consignments at their warehouse nearer to the gateway airport from various Sellers for arranging onward air-shipment upto the destination airport in India on consolidation basis. Seller, in consultation with the nominated air-cargo consolidation Service Provider, shall arrange for and bear all costs associated with preparation of documents, handling & inland transportation of such consignments upto the warehouse/gateway airport against purchase orders placed on FOB/FCA (by air) terms.
- d) All shipments of material and containerised cargo shall be made by suitable vessels certified for seaworthiness and complying with National/ International safety regulations and age (vintage) of the vessel being less than 25 years.

20.2. DOMESTIC/INDIGENOUS SUPPLIER:

- a) Where the Seller is required to undertake delivery of goods on FOB despatch station basis, the cost of handling & loading of goods on the carrier of Purchaser's nominated transporter/rail shall be arranged and paid by the Seller. The total order value includes all such associated costs.

- b) Where the Seller is required to undertake delivery of goods on DDP destination basis, handling & transportation of goods upto the designated site of the Purchaser, as specified in the purchase order, shall be arranged and paid by the Seller. The total order value includes all such associated costs.

20.3. Both Indian bidder and Foreign bidder must note that no trans-shipment en route is permitted. However, under exceptional circumstances, trans-shipment maybe allowed with prior consent of OIL. No charges shall be payable for such transshipment and consequent handling/storage of the goods.

21.0 **DOCUMENTATION (FOR OVERSEAS/ FOREIGN SUPPLIERS):**

21.1. This is a very important requirement. Seller is required to strictly follow this requirement and shall forward the document, as mentioned below, by air mail / courier immediately after the shipment is made:

	<u>Addressee</u>	<u>List of Documents</u>	<u>No. of copies</u>
(A)	To Purchaser's Banker through whom the L/C is established:	i) Clear negotiable Bill of Lading (Complete set)/ AWB duly signed and without any overwriting ii) Negotiable Copy of Invoice iii) Certificate of Origin copy iv) Declaration of Third-Party Inspection (TPI) Agency as per Proforma C in original, whenever involved	-1 -1 -1 -1
(B)	To Head (Kolkata Office) Oil India Limited 15A, HemantaBasuSarani Kolkata-700 001 Fax No. (91) 33-22101390/ 22202596	i) Copy of non-negotiable Bill of Lading/ AWB ii) Copy of non-negotiable invoice signed as in original in all pages iii) Certificate of Origin iv) Packing List v) Catalogues/ Literature, wherever applicable vi) Safety data sheet sets (in case of chemicals) vii) Tax Residency Certificate viii) Form No 10F (PROFORMA - D). ix) No Business Connection or Permanent Establishment Certificate (PROFORMA - E).	-3 -5 -3 -2 -1 -2 -1 -1 -1
(C)	To concerned purchase official, Oil India Limited (To be incorporated sphere wise)	i) Copy of non-negotiable Bill of Lading / AWB ii) Copy of non-negotiable invoice iii) Test / Inspection / TPI Certificate, If any (Original+Copy) iv) Literature / Catalogue, if applicable v) Packing List	-1 -1 -2 -1 -1
(D)	To concerned finance official, Oil India Limited (To be incorporated sphere wise)	i) Copy of non-negotiable invoice ii) Bill of Lading/AWB/ House AWB	-1 -1

Note: Literature/ catalogue is not required in case of spares (unless otherwise stated in the main order)

21.2. The Seller shall be responsible for making available the shipping documents as mentioned above to the Purchaser's bankers and to Purchaser's Kolkata office within seven (7) days (3 days in case of shipment from ports nearby Kolkata port like Singapore) prior to the listed arrival of the vessel at Kolkata port. For air consignments, documents should be received within seven (7) days from date of dispatch. If the documents are not made available as requested, it will not be possible for Purchaser to clear the consignments through Customs at the discharging port in time and the same will accrue demurrage. Such demurrage and other

expenses incurred by Purchaser due to late submission of documents (both negotiable and non-negotiable) or submission of incorrect documents by the Seller will be recoverable fully from the Seller/their Indian agent.

22.0 DOCUMENTATION (FOR DOMESTIC/INDIGENOUS SUPPLIERS):

- 22.1. Preparation and submission of proper documents by Seller is one of the very important requirements. The Seller must strictly follow the instructions.
- 22.2. Seller shall ensure that all the documents have clear reference of OIL's Purchase Order number.
- 22.3. Seller shall forward the documents, as mentioned below, by courier service immediately after the dispatch is made:

(I) WHERE PAYMENT AGAINST DIRECT SUBMISSION OF DESPATCH DOCUMENTS TO COMPANY:

A)	To concerned finance official Oil India Limited	i) ii) iii) iv) v) vi) vii) viii) ix)	Bill in original + one copy Copy of the C-Note/RR Copy of Mill Inspection Certificate, if any Copy of Third-Party Inspection Certificate, if any. Copy of Delivery Challan TPI Declaration as per Proforma C enclosed. (Original) Copy of Tax Invoice Copy of packing list. Documentary evidence of payment of Customs Duty, if any
B)	To concerned receiving official Oil India Limited	i) ii) iii) iv) v) vi) vii) viii)	Clear Consignee copy of RR/C-Note-Original+1 copy Copy of Tax Invoice Delivery Challan (Original) Packing list (Original) Mill inspection certificate, if any (Original) Third Party Inspection certificate, if any (Original) TPI Declaration as per Proforma C Enclosed-One Copy Warranty Certificate (Original)
C)	To concerned purchase official Oil India Limited		One set consisting copies of all the documents as mentioned in (B) above

Note: Where payment term is after receipt and acceptance of materials, the complete set of documents meant for Chief General Manager (A/P) as indicated in para 22.3 (I) (A) should be submitted to Dy. General Manager Materials (Receiving).

(II) WHEREVER DOCUMENTS TO BE NEGOTIATED THROUGH BANK:

(A)	To purchaser's Bankers (SBI/UBI/UCO /CANARA/ALLAHABAD BANK): One complete set of documents comprising of following + One extra set Above documents should be sent to Banker with clear instructions to them that the extra set of copies of above documents must be sent to Chief General Manager (A/P), OIL along with the intimation from Bank.	i) ii) iii) iv) v) vi) vii) viii) ix)	Clear Consignee copy of C-Note/ RR-Original Bill – Original Mill Inspection Certificate, if any – 1 copy Third Party Inspection certificate, if any – 1 copy Declaration by Third Party Inspector – 1 copy Delivery Challan – 1 copy Tax Invoice-Original Packing List – 1 copy Warranty Certificate – 1 copy Documentary evidence of payment of Customs Duty, if any
(B)	To concerned finance official Oil India Limited	i) ii) iii) iv)	Bill (Original + One Copy) Copy of the C-Note/RR Copy of Mill inspection certificate, if any Copy of Third-Party inspection certificate, if any

		v) vi) vii) viii) ix) x)	Copy of delivery Challan Declaration by Third Party Inspector as per Proforma C enclosed. (Original) Copy of Tax Invoice Copy of packing list. Copy of warranty certificate Documentary evidence of payment of customs duty, if any
C)	To concerned receiving official Oil India Limited	i) ii) iii) iv) v) vi) vii) viii)	Clear Consignee copy of RR / C-Note-Original +1 copy Copy of Tax Invoice Delivery Challan (Original) Packing list (Original) Mill inspection certificate, if any (Original) Third Party Inspection certificate, if any (Original) Copy of declaration by third party inspector as per Proforma C enclosed Warranty Certificate (Original)
D)	To concerned purchase official Oil India Limited		One set consisting of copies of the documents as mentioned in (B) above

23.0 INSPECTION AND TEST:

- 23.1. The Purchaser reserves the right to inspect and/or to test the goods/ equipment through its inspector to confirm that goods being supplied are in conformity to the order specifications.
- 23.2. The required inspection/test and place where such inspection/test is to be conducted shall be as specifically mentioned under the Technical Specifications/Special Conditions of Purchase Order/ Contract.
- 23.3. The Seller shall notify the Purchaser giving the date for inspection of the materials after its readiness so that purchaser may depute its inspector. The Purchaser shall communicate to the Seller the detail of inspector being deputed. In case of third-party inspection, the Seller shall notify the third-party inspection agency as provided in the purchase order/contract and shall also simultaneously inform the Purchaser and co-ordinate the inspection/testing of materials through the designated third-party inspection agency. In all such cases, the Seller shall give sufficient notice period as mentioned in the purchase order so as to mobilize the inspector.
- 23.4. The inspection/test may be conducted at Seller's works or at the final destination. When the inspection is carried out at Seller's, all facilities for inspection/testing including man-power, equipment etc. shall be provided by the Seller without any extra cost to the Purchaser.
- 23.5. Should any goods after inspection fails to conform to the specification, the Purchaser can reject such materials and the Seller shall have to replace such rejected materials/components complying with the required specifications without any extra cost to Purchaser.
- 23.6. Purchaser having inspected goods at Seller's works and cleared for despatch does not waive the right of the Seller/Purchaser to inspect the materials at final destination after arriving at Purchaser's site.
- 23.7. As may be necessary or specified in the purchase order, pre-despatch inspection may also be carried out by a team of officials from the relevant discipline of OIL.
- 23.8. Any and all expenses incurred in connection with test, preparation of report and analysis made by qualified laboratories, necessary technical documents, testing documents and drawings shall be at Seller's expense.
- 23.9. Arrangement for any inspection/ Certification required by Indian statutory authority shall be to Seller's account.
- 23.10. Nothing mentioned at sub-clauses under 23.0, shall in any way relieve the Seller from any warranty or other obligations under the purchase order/contract.

24.0 PRICE REDUCTION SCHEDULE FOR DELAY IN DELIVERY:

- 24.1. Subject to Force Majeure clause, if the Seller fails to deliver any or all ordered goods or to perform the service within the time period as specified in the purchase order, the Purchaser shall, without prejudice to other remedial measures under the purchase order, deduct from the purchase order price, a sum calculated (Liquidated damage) on the basis of the purchase order price, including subsequent modifications.
- 24.2. Deductions shall apply as per following formula:
In case of delay attributable to seller in delivery of ordered goods or delay in completion as per order terms, price reduction @ 0.5% per week of delay or part thereof of the value of the goods in respect of which default in delivery takes place, subject to a maximum of 7.5 % of the total supply order value (excluding site work). GST and other charges on account of deduction will be required to be paid by supplier/seller.
- 24.3. In case of package items (ordered as a complete system), the price adjustment shall be applicable on the entire order value of that package and not on the value of the undelivered portions (even though a billing breakup has been approved).
- 24.4. In case of purchase of bulk items where tolerance limit is specified (e.g. pipes, cables etc.), price adjustment clause shall be applicable on the actual quantity supplied, within the tolerance limit, instead of Purchase Order quantity.
- 24.5. In case of delay in delivery on the part of Seller, the invoice / document value shall be reduced as above and payment shall be released accordingly by the Purchaser.
- 24.6. In the event the invoice value is not reduced appropriately for the delay by the Seller, the Purchaser reserves the right to deduct the amount so calculated, from any amount falling due to the Seller or by recovery against the performance guarantee.
- 24.7. Both Seller and Purchaser agree that the above percentages of price reduction are genuine pre-estimates of the loss/damage which the Purchaser would have suffered on account of delay/ breach on the part of the Seller and the said amount will be payable on demand without there being any proof of the actual loss or damage caused by such breach/delay. Decision of the Purchaser in the matter of applicability of price reduction shall be final and binding.

25.0 FORCE MAJEURE:

- 25.1. In the event of either party being rendered unable by Force Majeure to perform any obligations required to be performed by them under the purchase order the relative obligations of the party affected by such force majeure shall upon notification to the other party be suspended for the period during which force majeure event lasts. The cost and loss sustained by the either party shall be borne by the respective parties.
- 25.2. The term force majeure as employed herein shall mean Acts of God such as earthquake, hurricane, typhoon, flood, volcanic activity etc.; war (declared /undeclared); riot, revolts, rebellion, terrorism, sabotage by persons other than the SELLER's Personnel; fires, explosions, ionizing radiation or contamination by radio-activity or noxious gas, if not caused by SELLER's fault; declared epidemic/pandemic or disaster; acts and regulations of respective Govt. of the two parties, namely the PURCHASER and the SELLER and civil commotions, lockout not attributable to the SELLER
- 25.3. Upon occurrence of such cause(s) and upon its termination, the party alleging that it has been rendered unable as aforesaid thereby, shall notify the other party by a registered letter duly certified by the statutory authorities immediately but not later than 7(seven) days of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of its claim.
- 25.4. Time for performance of the relative obligations suspended by the force majeure shall then be extended by the period for which such cause lasts. The extension of time shall be the sole remedy of the Seller for any delay under this clause and the Seller shall not be entitled in addition to or in lieu of such extension to claim any damages or compensation on any account whatsoever whether under the law governing contracts or any other law in force, and the Seller hereby waives and disclaims any and all contrary rights.

25.5. If the force majeure conditions persist for a period exceeding two (2) months, the Purchaser reserves the right to cancel the purchase order in full or in part.

26.0 TERMINATION OF PURCHASE ORDER:

26.1. Termination for Non-performance:

26.1.1. The Purchaser without prejudice to any other remedy for breach of purchase order, by giving a written notice for non-performance to the Seller, may terminate the purchase order in whole or in part for following reasons:

- i. In case a specified delivery schedule is not adhered to or the progress of the manufacturer or supply of the item is not satisfactory and is not in accordance with the progress schedule, or
- ii. In case Seller fails to deliver any or all part of the goods within the time period specified in the purchase order, or
- iii. If the Seller fails to perform any other obligation under the purchase order, and
- iv. If the Seller, in the either of the above condition, does not cure his failure within a stipulated period of 30 days (or such a longer period may authorize by the Purchaser in writing) after receipt of notice of non-performance from the Purchaser.
- v. In case Seller fails to deliver any or all part of the goods as per specifications, stipulated in the Purchase Order.

26.1.2. In the event the Purchaser terminates the purchase order in whole or in part, pursuant to clause 26.1.1, the Purchaser may procure, in the manner as deemed fit, goods similar to those undelivered and the Seller shall be liable to the Purchaser for any excess costs for such similar goods. However, the Seller shall continue performance of the purchase order to the extent not terminated. In such situation, Purchaser at its option shall forfeit the performance security without further any notice to the Seller.

26.1.3. In case of termination of the purchase order, due to reason mentioned at para 26.1.1, the vendor shall be put on holiday as per the provision of Banning Policy, 2017 of the Purchaser.

26.2. Termination on account of Death:

If the Seller is an individual or a proprietary concern and the individual or the proprietor dies or if the Seller is a partnership concern and one of the partner dies then unless, the Purchaser is satisfied that the legal representative of the individual or the proprietary concern or the surviving partners are capable of carrying out and completing purchase order, the Purchaser is entitled to cancel the purchase order for the uncompleted part without being in any way liable for any compensation payment to the estate of the deceased Seller and/or to the surviving partners of the Seller's firm on account of the cancellation of purchase order. The decision of the Purchaser in such assessment shall be final & binding on the parties. In the event of such cancellation, the Purchaser shall not hold the estate of the deceased Seller and/or the surviving partners of Seller's firm liable for any damages for non-completion of the purchase order.

26.3. Termination in case of Liquidation/Bankruptcy/Insolvency:

26.3.1. In the event that the Seller, at any time during the term of the purchase order, becomes insolvent or makes a voluntary assignment of its assets for the benefit of creditors or is adjudged bankrupt, then the Purchaser shall, by a notice in writing have the right to terminate the purchase order and all the rights & privileges of the Seller hereunder shall stand terminated forthwith.

26.3.2. However, Purchaser shall be at liberty to give the Receiver or Liquidator or other person, the option of carrying out the purchase order subject to his providing a guarantee upto an amount to be agreed upon by Purchaser for due and faithful performance of the purchase order.

26.4. Termination for Convenience:

26.4.1. The Purchaser may, by written notice sent to the Seller, terminate the purchase order, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of work under the purchase order is terminated and the date upon which such termination becomes effective.

26.4.2. The goods that are complete and ready for shipment within 30 days after the Seller's receipt of notice of termination shall be purchased by the Purchaser at the purchase order terms and prices. For the remaining goods the Purchaser may opt:

- (a) to have any portion completed and delivered at the purchase order terms and prices, and/or
- (b) to cancel the remainder and pay to the Seller an agreed amount for partially completed goods and for materials and parts previously procured by the Seller.

26.5. Termination due to change of ownership and Assignment:

In case the SUPPLIER's rights and /or obligations under the Purchase Order and/or the SELLER's rights, title and interest to the equipment/ material, are transferred or assigned without the PURCHASER's written consent, the PURCHASER may at its option, terminate this Purchase Order. PURCHASER shall not be however under any obligation to accord consent to the SUPPLIER for change of ownership & assignment of the contract.

26.6. Notwithstanding any provisions herein to the contrary, the Purchase Order may be terminated at any time by the SELLER on giving 07(Seven) days written notice to the SELLER due to any other reason not covered under the above Article from 26.1 to 26.5 and in the event of such termination the PURCHASER shall not be liable to pay any cost or damage to the SELLER except for payment for the goods, already delivered as per the Purchase Order upto the date of termination.

26.7. On termination of the Purchase Order, without prejudice to any other right or remedy available to OIL under the Purchase Order, in the event of OIL suffering any loss on account of delayed delivery or non-delivery or inferior quality of the material, OIL reserves the right to claim and recover damages from the Vendor in respect thereof.

26.8. Termination for submission of fraudulent documents:

If any information given by a bidder is found to be incorrect in any particular considered by OIL to be relevant for the evaluation of the bid/ tender, or is found by OIL to misrepresent or conceal facts, or if any of the documents submitted by the bidder in support of or relevant to the bid/ tender is found by OIL to be forged, false or fabricated, OIL shall reject the bid, and without prejudice to any other right(s) of action or remedy available to OIL, OIL shall forfeit the Earnest Money given by the bidder list as per the provision of Banning Policy, 2017 of OIL. If prior to the discovery of the incorrect information, misrepresentation or forged, false or fabricated document (s), the bid has resulted in a Purchase Order/Contract, the Purchase Order/Contract shall be liable to be terminated by OIL. In such situation the performance security / EMD shall be forfeited.

27.0 GENERAL HEALTH, SAFETY & ENVIRONMENT (HSE) GUIDELINES:

(Applicable in case of the Tenders/Purchase Orders involving Fabrication, Installation and Commissioning at Purchaser's site)

27.1. It will be solely the SELLER's responsibility to fulfill and to comply all the legal formalities with respect to the Health, Safety and Environmental aspects of the entire job (namely; the person employed by him, the equipment, the environment, etc.)

27.2. It will be entirely the responsibility of the Supplier/ his Supervisor/representative to ensure strict adherence to all HSE measures and statutory rules during operation in OIL's installations and safety of workers engaged by him. The crew members will not refuse to follow any instruction given by company's Installation Manager/ Safety Officer/ Engineer/ Official/ Supervisor/ Junior Engineer for safe operation.

27.3. Any compensation arising out of the job carried out by the SELLER whether related to pollution, Safety or Health will be paid by the Seller only.

27.4. Any compensation arising due to accident of the Seller's personnel while carrying out the job, will be payable by the Seller.

27.5. When there is a significant risk to health, environment or safety of a person or place arising because of a non-compliance of HSE Measures Purchaser shall have the right to direct the Seller to cease work until the non-compliance is corrected.

28.0 APPLICABLE LAW AND JURISDICTION OF COURT:

- 28.1. The consequent Contract/Purchase Order shall be deemed to be a Contract made under, governed by and construed in accordance with the laws of India for the time being in force and shall be subject to the sole and exclusive jurisdiction of the Commercial Courts situated in Dibrugarh (or the Place where the contract is executed) and Principal Bench of Gauhati High Court (or the High Court under whose territorial jurisdiction, the place falls, where the contract is executed).
- 28.2. The consequent Contract/Purchase Order including all matter connected with the Contract/Purchase Order, shall be governed by the laws of India (both substantive and procedural) for the time being in force and shall be subject to exclusive jurisdiction of Courts, mentioned hereinabove. Foreign companies, operating in India or entering into Joint ventures in India, shall also be governed by the laws of India and shall be subject to sole and exclusive jurisdiction of above Courts.

29.0 SETTLEMENT OF DISPUTES AND ARBITRATION:

29.1. ARBITRATION (APPLICABLE FOR SUPPLIER/CONTRACTOR OTHER THAN PSU/GOVT. DEPARTMENTS AND MSMEs):

- 29.1.1. Except as otherwise provided elsewhere in the purchase order, if any dispute, difference, question or disagreement arises between the parties or their respective representatives or assignees, in connection with construction, meaning, operation, effect, interpretation of the consequent purchase order/contract or breach thereof which parties are unable to settle mutually or through mutually appointed Outside Expert Committee (OEC), the same shall be referred to Arbitration as provided hereunder:
- 29.1.2. A party wishing to commence arbitration proceeding shall invoke Arbitration Clause by giving 30 days' notice to the other party. The notice invoking arbitration shall specify all the points of dispute with details of the amount claimed to be referred to arbitration at the time of invocation of arbitration and not thereafter. If the claim is in foreign currency, the claimant shall indicate its value in Indian Rupee for the purpose of constitution of the arbitral tribunal.
- 29.1.3. The number of arbitrators and the appointing authority shall be as under:

Claim Amount (excluding claim for interest and counter claim, if any)	Number of Arbitrator	Appointing Authority
Upto Rs.5.00 Crore	Not Applicable	Not Applicable
Above Rs.5.00 Crore and Upto Rs. 25 Crore	Sole Arbitrator	OIL
Above Rs. 25 Crore	Three Arbitrators	One Arbitrator by each party and the 3 rd Arbitrator, who shall be the Presiding Arbitrator, by the two Arbitrators.

- 29.1.4. The parties agree that they shall appoint only those persons as arbitrators who accept the conditions of the arbitration clause. No person shall be appointed as Arbitrator or Presiding Arbitrator who does not accept the conditions of the arbitration clause.
- 29.1.5. If any of the Arbitrators so appointed dies, resigns, becomes incapacitated or withdraws for any reason from the proceedings, it shall be lawful for the concerned party/arbitrators to appoint another person in his place in the same manner as aforesaid. Such person shall proceed with the reference from the stage where his predecessor had left if both parties consent for the same; otherwise, he shall precede de novo.
- 29.1.6. Parties agree that neither shall be entitled for any pre-reference or pendente lite interest on its claims. Parties agree that any claim for such interest made by any party shall be void.
- 29.1.7. If after commencement of the arbitration proceedings, the parties agree to settle the dispute mutually or refer the dispute to conciliation, the arbitrators shall put the proceedings in abeyance until such period as requested by the parties.

- 29.1.8. Each party shall be responsible to decide for the travel and stay etc. of the arbitrator pointed by it. Claimant shall also be responsible for planning for travel/ stay arrangements of the Presiding Arbitrator and the expenses incurred shall be shared equally by the parties.
- 29.1.9. In case of sole arbitrator, OIL shall make all necessary arrangements for his travel, stay and the expenses incurred shall be shared equally by the parties.
- 29.1.10. The Arbitration shall be held at the place from where the contract /purchase order has been awarded. However, parties to the contract / purchase order can agree for Venue of Arbitration, different from the place of arbitration within India for the convenience of all concerned.
- 29.1.11. The fees to arbitrator(s) shall be governed by the Fourth Schedule of the Arbitration and Conciliation Act, 1996. The fees to the arbitrator(s) and secretarial expenses shall be paid in following manner:
- (i) 20% of the fees on submission of Statement of Claim and Counter Claim by the Claimant and Respondent respectively
 - (ii) 20% of the fees on completion of pleadings
 - (iii) 20% of the fees on commencement of the hearing
 - (iv) 40% of the Fees on conclusion of hearing and before passing of final award.

However, subject to agreement by the Parties, the arbitrator(s) may determine a lump sum amount to be paid towards arbitrator's fees and secretarial expenses by the parties on commencement of the proceedings, which is to be adjusted against first instalment of payment, as prescribed in sl.(ii) above.

- 29.1.12. The Arbitrator(s) shall give reasoned and speaking award and it shall be final and binding on the parties.
- 29.1.13. Subject to aforesaid, provisions of the Arbitration and Conciliation Act, 1996 and any statutory modifications or re-enactment thereof shall apply to the arbitration proceedings under this clause.
- 29.1.14. It is agreed and undertaken by the Parties that irrespective of country of origin of the SELLER, the arbitration proceedings shall be governed by the Arbitration and Conciliation Act, 1996 and under no circumstances, the proceedings shall be construed as International Arbitration.

29.2. ARBITRATION (APPLICABLE IN CASE OF PURCHASE ORDER AWARDED ON CPSE AND GOVT. DEPARTMENTS/ ORGANIZATIONS):

In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs)/ Port Trusts inter se and also between CPSEs and Government Departments/Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such dispute or difference shall be taken up by either party for resolution through AMRCD as mentioned in DPE OM No. 4(1)/2013-DPE(GM)/FTS-1835 dated 22-05-2018.

The Committee of Secretaries at the First level (tier) shall finalise its decision within 3(three) months after having received the reference/notice in writing regarding the dispute from the concerned aggrieved party.

Any party aggrieved with the decision of the Committee at the First level (tier) may prefer an appeal before the Cabinet Secretary at the Second level (tier) within 15 days from the date of receipt of decision of the Committee at First level, through its administrative Ministry/Department, whose decision will be final and binding on all concerned.

The Arbitration and Conciliation Act 1996 shall not be applicable to the Arbitration under this clause.

29.3. ARBITRATION (APPLICABLE TO MICRO, SMALL AND MEDIUM ENTERPRISE)

In the event of any dispute or difference relating to, arising from or connected with the Purchase Order, efforts shall be made to resolve the dispute(s) amicably by mutual consultation and in case such dispute(s) cannot be resolved through mutual consultation, then same shall be resolved through the procedure as prescribed in Section-18 of the Micro, Small and Medium Enterprises Development Act, 2006

30.0 RESOLUTION OF DISPUTES THROUGH CONCILIATION BY OUTSIDE EXPERT COMMITTEE (OEC):
(Not applicable in cases valuing less than Rs 25 lakhs)

- 30.1. If any dispute, difference, question or disagreement arises between the parties hereto or their respective representatives or assignees, in connection with construction, meaning, operation, effect, interpretation of the purchase order/contract or breach thereof which parties are unable to settle mutually, subject to consent of the Seller, the Purchaser at its discretion may first refer to conciliation through Outside Expert Committee (OEC) to be constituted by CMD, OIL as provided hereunder.
- 30.2. The party desirous of resorting to conciliation shall send a notice of 30 (thirty) days to the other party of its intention of referring the dispute for resolution through OEC. The notice invoking conciliation shall specify all the points of disputes with details of the amount claimed to be referred to OEC and the party concerned shall not raise any new issue thereafter.
- 30.3. CMD, OIL shall nominate three outside Experts, one each from Financial/commercial, Technical and Legal fields from the Panel of Outside Experts maintained by OIL who shall together be referred to as OEC (Outside Experts Committee).
- 30.4. Parties shall not claim any interest on claims/counterclaims from the date of notice invoking conciliation till execution of settlement agreement, if so arrived at. In case, parties are unable to reach a settlement, no interest shall be claimed by either party for the period from the date of notice invoking conciliation till the date of OEC recommendations in any further proceeding.
- 30.5. The Proceedings of the OEC shall be broadly governed by Part III of the Arbitration and Conciliation Act, 1996 including any modifications thereof.
- 30.6. The parties shall be represented by their in-house employees/executives. No party shall bring any advocate or outside consultant/advisor/agent. Ex-officers of OIL who have handled the matter in any capacity directly or indirectly shall not be allowed to attend and present the case before OEC on behalf of Contractor. However, ex- employees of parties may represent their respective organizations.
- 30.7. OEC shall hear both the parties and recommend possible terms of settlement between the parties. The recommendations of OEC shall be non-binding and the parties may decide to accept or not to accept the same or may accept part of the recommendation. Parties shall be at liberty to accept the OEC recommendation with any modification they may deem fit.
- 30.8. Where recommendations are acceptable to both the parties, a settlement agreement will be drawn up in terms of the OEC recommendations or with such modifications as may be agreed upon by the parties. The settlement agreement shall be signed by both the parties. This settlement agreement shall have the same legal status and effect as that of an arbitration award on agreed terms on the substance of the dispute rendered by an arbitral tribunal under Section 30 of the Arbitration and Conciliation Act, 1996.
- 30.9. OIL will share all other guidelines regarding reconciliation through OEC with the supplier when it resorts to settlement through OEC. Both parties agree to adhere to these guidelines.
- 30.10. All the expenditure incurred in the OEC proceedings shall be shared by the parties in equal proportion. The parties shall maintain account of expenditure and present to the other for the purpose of sharing on conclusion of the OEC proceedings.

If the parties are not able to resolve the dispute through OEC or do not opt for conciliation through OEC, the party may invoke arbitration clause as provided in the contract / purchase order.

It is expected to conclude a case by OEC within 8-10 weeks. The place of conciliation shall be Guwahati for all purchase orders issued from the Field HQ, Duliajan and Pipeline HQ, Guwahati, whereas, New Delhi shall be the Place of Conciliation for all other Purchase Orders issued by other spheres of OIL.

Solicitation or any attempt to bring influence of any kind on either OEC Members or PURCHASER is completely prohibited in conciliation proceedings and PURCHASER reserves the absolute right to close the conciliation proceedings at its sole discretion if it apprehends any kind of such attempt made by the SELLER or its representatives.

31.0 EXCLUSIONS

Parties agree that following matters shall not be referred to conciliation or arbitration or OEC:

- i) Any claim, difference or dispute relating to, connected with or arising out of OIL's decision to initiate any proceedings for suspension or debarment or banning, or decision to suspend or to ban or to debar business dealings with the Bidder / Seller and/or with any other person involved or connected or dealing with bid / contract / bidder / Supplier.
- ii) Any claim, difference or dispute relating to, connected with or arising out of OIL's decision under the provisions of Integrity Pact executed between OIL and the Bidder / Supplier.
- iii) Any claim, difference or dispute relating to, connected with or arising out of OIL's decision to comply with any order or directive of any statutory or government authority.

32.0 SET-OFF:

Any sum of money due and payable to the Seller (including Security Deposit refundable to them) under the consequent order or any other purchase order may be appropriated by Oil India Limited and set-off against any claim of Oil India Limited (or such other person or persons contracting through Oil India Limited) for payment of a sum of money arising out of the purchase order or under any other purchase order made by the Seller with Oil India Limited (or such other person or persons contracting through Oil India Limited).

33.0 DISPOSAL OF REJECTED MATERIALS AT PURCHASER'S SITE:

In case any material is rejected by the Purchaser after receipt at site, the Seller shall be informed about the same including the reasons for rejection. Seller shall also be advised about the location where the rejected materials are lying at risk and cost of the Seller. The Seller shall also be advised to remove or dispose of the materials within 4(four) weeks from the date of notice, failing which the Purchaser will be entitled to dispose-off the materials at risk and cost of the Seller.

34.0 ERRING / DEFAULTING AGENCIES:

Erring and defaulting agencies like bidder, Seller, supplier, vendor, service provider will be dealt as per OIL's Banning Policy dated 6th January, 2017 available in OIL's website: www.oil-india.com. Moreover, OIL reserves the right to take legal or any other action on the basis of merit of the case.

35.0 LIABILITY OF UNION GOVERNMENT OF INDIA:

It is expressly understood and agreed upon by and between SUPPLIER and PURCHASER that PURCHASER is entering into this agreement solely on its own behalf and not on behalf of any other person or entity. In particular, it is expressly understood and agreed that Union of India is not a party to this agreement and has no liabilities, obligations or rights, whatsoever hereunder. It is expressly understood and agreed that PURCHASER is an independent legal entity with power and authority to enter into contracts solely on its own behalf under the applicable laws of India and general principles of the Contract law. The bidder/ Supplier expressly agrees, acknowledges and understands that Purchaser is not an agent, representative or delegate of the Union of India. It is further understood and agreed that Union of India is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the contract. Accordingly, bidder/ SUPPLIER hereby expressly waives, releases and foregoes any and all actions or claims, including cross claims, impleader claims or counter claims against the Union of India arising out of the Purchase Order and covenants not to sue the Union of India as to any manner, claim, cause of action or thing whatsoever arising of or under the Purchase Order.

36.0 WAIVERS:

It is fully understood and agreed that none of the terms and conditions of this agreement shall be deemed waived by either party unless such waiver is executed in writing only by the duly authorized representatives of both the parties. The failure of either party to execute any right shall not act as a waiver of such right by such party.

37.0 SEVERABILITY:

Should any provision of this agreement be found to be invalid, illegal or otherwise not enforceable by any court of law, such finding shall not affect the remaining provisions hereto and they shall remain binding on the parties hereto.

ANNEXURE – B

BID REJECTION CRITERIA & BID EVALUATION CRITERIA

The bids shall conform to the specifications and terms & conditions given in the Tender. Bids shall be rejected in case the items offered do not conform to the required parameters stipulated in the technical specifications and to the relevant international/national standards wherever stipulated. Notwithstanding the general conformity of the bids to the stipulated specifications and terms & conditions, the following requirements must be particularly met by the bidders, without which the offer shall be considered as non-responsive and rejected:

A) BID REJECTION CRITERIA (BRC) :

A.1 TECHNICAL:

A.1.1 Bid should be complete in all aspects covering entire scope of job / supply and should conform to the technical specifications indicated in the bid document, duly supported with detailed technical catalogues, literatures and detailed drawing. Incomplete and non-conforming bids will be rejected outright.

A.1.2 The bidder must be the Rig Manufacturer who should have supplied complete drilling rig packages for onshore drilling application subject to qualifying either one of the following criteria:

The bidder should be manufacturer (OEM) of mast, substructure and crown block assembly for rig of tendered or higher capacity with valid API-4F, PSL-2 certification and should be rig package integrator, having experience of supplying complete drilling rig package(s) complying with clause A.1.2.1.

OR

The bidder should be manufacturer of the three major rig components namely Draw-Works, Top Drive and Drilling Control System and should be rig package integrator, having experience of supplying complete drilling rig package(s), complying with clause A.1.2.2.

For past experiences, the bidder of the offered rigs should satisfy the following (A.1.2.1 or A.1.2.2, whichever is applicable and A.1.2.3) along with documentary evidence, which should be enclosed along with the techno-commercial bid.

A.1.2.1 MANUFACTURING AND SUPPLY EXPERIENCE IN CASE THE BIDDER IS MAST, SUBSTRUCTURE AND CROWN BLOCK ASSEMBLY MANUFACTURER:

A.1.2.1 (A) The bidder (Manufacturer of Mast, Substructure and Crown block assembly) shall have an experience of minimum ten (10) years in manufacturing and supplying of Mast, Substructure and Crown block assembly under API Specification 4F, PSL-2 Certification.

Bidder in support of manufacturing under API specification for minimum ten (10) years, should submit copies of their API-4F, PSL-2 Certification with scope of licenses including Mast, Substructure and Crown Block Assembly covering a period of at least ten (10) years, in the last fifteen (15) years, preceding the original bid closing date, of this tender, along with the technical bid. The copies of API-4F certificates shall be for the facility from which the supplies are intended to be made.

For the facility from where supplies are intended, the bidder shall have valid API Spec 4F, PSL-2 certificate on the Bid Closing Date and submit the same along with the bid. The bidder shall also submit an undertaking that the Mast, Substructure and Crown block assembly shall be API-4F, PSL-2 monogrammed and the API-4F Certification shall remain valid continuously during the entire period of supply of rigs.

A.1.2.1 (B) The bidder (Manufacturer of Mast, Substructure and Crown block assembly) should also have the experience of supplying at least three (03) numbers of complete Drilling Rigs of tendered or higher capacity after manufacturing mast, substructure & crown block assembly and integrating the Draw-Works, Top Drive, Drilling Control System and other rig equipment during the last ten (10) years preceding the original bid closing date, of this tender, to E&P companies / Drilling Contractors/ Drilling Rig Package Integrators/ Drilling service providers to the Oil and Gas industry.

The bidder shall submit copies of relevant contract(s) / Purchase Order(s) for supply of Drilling Rigs of tendered or higher capacity placed on them along with supporting documents clearly indicating the details of the rig mast and other rig components as above.

The bidder should also submit copies of the following documents in respect of satisfactory execution of each of those Contract(s) / Purchase Order(s) failing which the bids will be rejected:

- (i) Copies of sealed & signed Rig commissioning certificate from end users in respect of all the three (03) drilling rigs delivered (OR)
- (ii) Bill of Lading (OR)
- (iii) Consignee delivery receipt / challan (OR)
- (iv) Central Excise Gate Pass/Tax Invoice issued under relevant rules of Central Excise/Vat/GST (OR)
- (v) Commercial Invoice/ Payment Invoice

Note:

- a) The Contract(s) / Purchase Order(s) date need not be within 10 (ten) years preceding the original bid closing date of this tender. However, the execution of supply should be within 10 (ten) years preceding original bid closing date of this tender.
- b) Original Bid Closing Date shall be considered by OIL for evaluation of BRC Criteria in case of any extension of the bid closing date.
- c) Originals of documentary evidence are to be produced for verification on demand of OIL.
- d) A job executed by a bidder for its own organization / subsidiary cannot be considered as experience for the purpose of meeting BEC.
- e) The details of Manufacturing & Supply experience should be submitted in tabular format (as per **Annexure-B2**) in the technical bid.
- f) The make, model, capacity and technical details of the Drilling Rig, Mast, Substructure, Crown block assembly, Draw-Works, Top Drive and Drilling Control System should be clearly indicated in the submitted documentary evidence.

A.1.2.1 (C) All the three equipment (i.e., Draw-Works, Top Drive and Drilling Control System) should be of same make. The bidder shall submit following documents for the manufacturing plant(s) from which the above three rig components are proposed to be sourced:

Copies of contract(s) / purchase order(s) for supply of minimum three (03) sets of Draw-Works, Top Drive and Drilling Control System (each set consisting of a Draw-Works, Top Drive and Drilling Control System) for Drilling Rigs of tendered or higher capacity by the quoted manufacturing plant(s) along with supporting documents clearly indicating the details of the rig mast and other rig components as above during the last ten (10) years preceding the original bid closing date of this tender to E&P companies / Drilling Contractors / Drilling Rig Package Integrators / Drilling service providers to Oil and Gas industry.

Documentary evidence in respect of the above should be submitted in the form of copies of relevant Contract(s) / Purchase Order(s) along with copies of the following documents in respect of satisfactory execution of each of those Contract(s) / Purchase Order(s) failing which the bids will be rejected:

- (i) Copies of sealed & signed Rig commissioning certificate from end users in respect of all the three (03) sets delivered (OR)
- (ii) Bill of Lading (OR)
- (iii) Consignee delivery receipt / challan (OR)
- (iv) Central Excise Gate Pass/Tax Invoice issued under relevant rules of Central Excise/Vat/GST (OR)
- (v) Commercial Invoice/ Payment Invoice

Note:

- a) The Contract(s) / Purchase Order(s) date need not be within 10 (ten) years preceding the original bid closing date of this tender. However, the execution of supply should be within 10 (ten) years preceding original bid closing date of this tender.
- b) Original Bid Closing Date shall be considered by OIL for evaluation of BRC Criteria in case of any extension of the bid closing date.
- c) Originals of documentary evidence are to be produced for verification on demand of OIL.
- d) A job executed by a bidder for its own organization / subsidiary cannot be considered as experience for the purpose of meeting BEC.
- e) Same company will be considered as same make.
- f) The details of Manufacturing & Supply experience should be submitted in tabular format (**as per Annexure-B2**) in the technical bid.
- g) The make, model, capacity and technical details of the Drilling Rig, Draw-Works, Top Drive and Drilling Control System should be clearly indicated in the submitted documentary evidence.
- h) The description of Drilling Control System is provided at **Appendix-AA-I**, which shall be considered with respect to experience on Drilling Control System.

A.1.2.2 MANUFACTURING AND SUPPLY EXPERIENCE IN CASE THE BIDDER IS RIG EQUIPMENT (DRAW-WORKS, TOP DRIVE AND DRILLING CONTROL SYSTEM) MANUFACTURER:

- A.1.2.2(A) The bidder (Manufacturer of Draw-Works, Top Drive & Drilling Control System) should have the experience of supplying at least three (03) numbers of complete Drilling Rigs of tendered or higher capacity after manufacturing the Draw-Works, Top Drive, Drilling Control System etc. and integrating with mast, substructure, crown block assembly and other rig equipment during the last ten (10) years preceding the original bid closing date, of this tender to E&P companies / Drilling Contractors / Drilling Rig Package Integrators / Drilling service providers to Oil and Gas industry.

Documentary evidence in respect of the above should be submitted in the form of copies of relevant Contract(s) / Purchase Order(s) along with copies of any of the following documents in respect of satisfactory execution of each of those Contract(s) / Purchase Order(s) failing which the bids will be rejected:

- (i) Copies of sealed & signed Rig commissioning certificate from end users in respect of all the three (03) drilling rigs delivered (OR)
- (ii) Bill of Lading (OR)
- (iii) Consignee delivery receipt / challan (OR)
- (iv) Central Excise Gate Pass/Tax Invoice issued under relevant rules of Central Excise/Vat/GST (OR)
- (v) Commercial Invoice/ Payment Invoice

Note:

- a) The Contract(s) / Purchase Order(s) date need not be within 10 (ten) years preceding the original bid closing date of this tender. However, the execution of supply should be within 10 (ten) years preceding original bid closing date of this tender.
- b) Original Bid Closing Date shall be considered by OIL for evaluation of BRC Criteria in case of any extension of the bid closing date.
- c) Originals of documentary evidence are to be produced for verification on demand of OIL.
- d) A job executed by a bidder for its own organization / subsidiary cannot be considered as experience for the purpose of meeting BEC.
- e) Same company will be considered as same make.
- f) The details of Manufacturing & Supply experience should be submitted in tabular format (**as per Annexure-B2**) in the technical bid.
- g) The make, model, capacity and technical details of the Drilling Rig, Mast, Substructure, Crown block assembly, Draw-Works, Top Drive and Drilling Control System should be clearly indicated in the submitted documentary evidence.
- h) The description of Drilling Control System is provided at **Appendix-AA-I**, which shall be considered with respect to experience on Drilling Control System.

A.1.2.2 (B) The bidder (Manufacturer of Draw-Works, Top Drive & Drilling Control System) shall also submit following documents for the manufacturing plant from which Rig Mast, Substructure and crown block assembly is proposed to be sourced:

- (1) Copy(ies) of API Spec 4F, PSL-2 Certification with scope of licenses including Mast, Substructure and crown block assembly covering a period of at least 10 years in the last fifteen (15) years, preceding the original bid closing date, of this tender, along with the technical bid.
- (2) Copy(ies) of API-4F, PSL-2 Certificate valid on the bid closing date along with an undertaking that the Mast, Substructure and crown block assembly shall be API-4F, PSL-2 monogrammed and the API-4F Certification shall remain valid continuously during the entire period of supply of rigs.
- (3) Copy(ies) of Contract(s) / Purchase Order(s) for supply of minimum three (03) numbers each of Mast, Substructure and crown block assembly for Drilling Rigs of tendered or higher capacity by the quoted manufacturing plant along with supporting documents clearly indicating the technical details of the rig mast and other rig components during the last ten (10) years preceding the original bid closing date of this tender. The copies of contract(s) / purchase order(s) submitted can be for individual equipment (Mast, Substructure and Crown block assembly) or for supply of rig integrated with other equipment to E&P companies / Drilling Contractors / Drilling Rig Package Integrators / Drilling service providers to Oil and Gas industry.

Documentary evidence in respect of the above should be submitted in the form of copies of relevant Contract(s) / Purchase Order(s) along with copies of the following documents in respect of satisfactory execution of each of those Contract(s) / Purchase Order(s) failing which the bids will be rejected:

- (i) Copies of sealed & signed Rig commissioning certificate from end users in respect of all the three (03) drilling rigs delivered (OR)
- (ii) Bill of Lading (OR)
- (iii) Consignee delivery receipt / challan (OR)
- (iv) Central Excise Gate Pass/Tax Invoice issued under relevant rules of Central Excise/Vat/GST (OR)
- (v) Commercial Invoice/ Payment Invoice

Note:

- a) The Contract(s) / Purchase Order(s) date need not be within 10 (ten) years preceding the original bid closing date of this tender. However, the execution of supply should be within 10 (ten) years preceding original bid closing date of this tender.
- b) Original Bid Closing Date shall be considered by OIL for evaluation of BRC Criteria in case of any extension of the bid closing date.
- c) Originals of documentary evidence are to be produced for verification on demand of OIL.
- d) A job executed by a bidder for its own organization / subsidiary cannot be considered as experience for the purpose of meeting BEC.
- e) The details of Manufacturing & Supply experience should be submitted in tabular format **(as per Annexure-B2)** in the technical bid.
- f) The make, model, capacity and technical details of the Drilling Rig, Mast, Substructure and Crown block assembly should be clearly indicated in the submitted documentary evidence.

A.1.2.3 **In addition to A.1.2.1 or A.1.2.2 (whichever is applicable), bidder's offer must comply to the following:**

For the other Rig equipment (listed at Clause No. 11.12 of Annexure-AA of the Tender), the bidder can either source the equipment from the specified Manufacturers listed at Clause No. 11.12 of Annexure-AA of the tender, or source from any other Manufacturer (including self), as per the following conditions:

- (A) In case bidder sources the other Rig equipment (listed at **Clause No. 11.12 of Annexure-AA** of the Tender), from amongst the specified Manufacturers then the Bidder is not required to submit any documentary evidence in support of manufacturing and / or supply experience of the Manufacturer of the particular equipment.

- (B) In case bidder sources the other Rig equipment (listed at **Clause No. 11.12 of Annexure-AA** of the Tender), from any other Manufacturer (including self) which are not specified in the list at **Clause No. 11.12 of Annexure-AA** of the Tender, then the bidder should submit the following documentary evidence from the quoted manufacturer(s), along with the techno-commercial bid:

Copies of contract(s) / purchase order (s) for supply of minimum three (03) numbers of the particular rig equipment of tendered capacity / rating or higher capacity / rating by the quoted manufacturing plant to E&P Companies / Drilling Contractors / Drilling Rig Package Integrators / Drilling Service Providers to Oil and Gas industry, during the last ten (10) years preceding the original bid closing date, of the tender.

Documentary evidence in respect of above should be submitted in the form of copies of relevant Purchase Order(s) along with copies of any of the following documents in respect of satisfactory execution of each of those Purchase Order(s) failing which the bids will be rejected:

- (i) Signed & sealed satisfactory supply/completion report (OR)
- (ii) Bill of Lading (OR)
- (iii) Consignee delivery receipt / challan (OR)
- (iv) Central Excise Gate Pass/Tax Invoice issued under relevant rules of Central Excise/Vat/GST (OR)
- (v) Commercial Invoice/ Payment Invoice

Note:

- a) The Contract(s) / Purchase Order(s) date need not be within 10(ten) years preceding the original bid closing date of this tender. However, the execution of supply should be within 10 (ten) years preceding original bid closing date of this tender.
- b) Original Bid Closing Date shall be considered by OIL for evaluation of BRC Criteria in case of any extension of the bid closing date.
- c) Originals of documentary evidence are to be produced for verification on demand of OIL.
- d) For any tendered Rig equipment (Listed at Clause No. 11.12 of **Annexure-AA** of the Tender) if the manufacturer has successfully executed minimum three (03) numbers of equipment of same capacity or higher capacity to Oil India Limited (either directly or indirectly) during the last ten (10) years preceding the original bid closing date, of this tender, documentary evidence from the manufacturer need not be submitted. In this situation the bidder shall have to indicate the Purchase Order (P.O.) Number of OIL in their technical bid.
- e) The details of Manufacturing & Supply experience should be submitted in tabular format (**as per Annexure-B2**) in the technical bid.
- f) The make, model, capacity and technical details of the quoted equipment should be clearly indicated in the submitted documentary evidence.

Note to BRC A.1.2.1, A.1.2.2 & A.1.2.3:

In case the bidder complies the above BEC requirement regarding experience of manufacturing and supply based on their existing facility and desires to manufacture/ assemble various rig equipment in India by using any of the existing facilities available in India having requisite API approval, the same is permissible.

Bidder(s) has to indicate categorically in their technical bid, the item(s) which they intend to manufacturer/ assemble in the facility(ies) in India as per the above provision.

A.1.3 All the five (05) numbers of Rigs packages will be procured from same source.

Bidder should quote for all five numbers of Drilling Rig packages. Bidder not quoting for full quantities from the same source will be rejected. The bidder shall confirm that make and model of any equipment integrated in the rig shall be same for all the five rigs.

A.1.4**DELIVERY PERIOD:**

Time is of the essence of this procurement and materials must be supplied within the stipulated delivery schedule in the event of an order. Therefore, Bids submitted by Bidders quoting delivery schedule other than mentioned in the tender shall be rejected.

Overseas Bidder			
Award type	Lot reference	Delivery schedule	Date of delivery
FOB Port of Shipment	First Lot of Two Rigs	Within 14 months from the date of issue of Letter of Award (LOA)	Date of unambiguous Bill of Lading (Freight forwarder nomination time and freight forwarder readiness time to be excluded)
	Second Lot of Two Rigs	Within 26 months from the date of issue of Letter of Award (LOA)	
	Third Lot of One Rig	Within 36 months from the date of issue of Letter of Award (LOA)	
C&F/CIF Kolkata	First Lot of Two Rigs	Within 16 months from the date of issue of Letter of Award (LOA)	IGM (Import General Manifest) Date
	Second Lot of Two Rigs	Within 28 months from the date of issue of Letter of Award (LOA)	
	Third Lot of One Rig	Within 38 months from the date of issue of Letter of Award (LOA)	

Indian Bidder			
Award type	Lot reference	Delivery schedule	Date of delivery
F.O.R Despatching Station	First Lot of Two Rigs	Within 14 months from the date of issue of Letter of Award (LOA)	Date of LR/C Note
	Second Lot of Two Rigs	Within 26 months from the date of issue of Letter of Award (LOA)	
	Third Lot of One Rig	Within 36 months from the date of issue of Letter of Award (LOA)	
F.O.R Destination (Duliajan)	First Lot of Two Rigs	Within 16 months from the date of issue of Letter of Award (LOA)	Date of Reporting at Destination (Duliajan).
	Second Lot of Two Rigs	Within 28 months from the date of issue of Letter of Award (LOA)	
	Third Lot of One Rig	Within 38 months from the date of issue of Letter of Award (LOA)	

A.2 FINANCIAL:

- A.2.1 The bidder shall have an annual financial turnover of minimum **US\$ 32,588,568.00 or Rs. 243.92 Crore** during any of the preceding 3 (Three) financial/accounting years reckoned from the original bid closing date of the tender.
- A.2.2 "Net Worth" of the bidder must be positive for the financial/accounting year just preceding to the original Bid Closing Date of the Tender (**i.e., Year 2020-21**).
- A.2.3 Considering the time required for preparation of Financial Statements, if the last date of preceding financial/accounting year falls within the preceding six months reckoned from the original bid closing date and the Financial Statements of the preceding financial/accounting year are not available with the bidder, then the financial turnover of the previous three financial/accounting years excluding the preceding financial/accounting year will be considered. In such cases, the Net worth of the previous financial/accounting year excluding the preceding financial/accounting year will be considered. However, the bidder has to submit an affidavit/ undertaking (**ref. PROFORMA-B1**) certifying that "the balance sheet/Financial Statements for the financial year **2020-21** has actually not been audited so far".

Note:

- a) For proof of Annual Turnover & Net worth any one of the following document must be submitted along with the technical bid:-
- i) A certificate issued by a practicing Chartered Cost Accountant (with Membership Number and Firm Registration Number), certifying the Annual Turnover & Net worth as per format prescribed in **PROFORMA-B2**.
- OR
- ii) Audited Balance Sheet alongwith Profit & Loss account. In case of foreign bidders, self-attested/digitally signed printed published accounts are also acceptable.
- b) In case the bidder is a Central Govt. Organization/PSU/State Govt. Organization/Semi-State Govt. Organization or any other Central/ State Govt. Undertaking, where the auditor is appointed only after the approval of Comptroller and Auditor General of India and the Central Government, their certificates may be accepted even though FRN is not available. However, bidder to provide documentary evidence for the same.
- A.2.4 In case the Audited Balance Sheet and Profit & Loss Account submitted along with the bid are in currencies other than INR or US\$, the bidder shall have to convert the figures in equivalent INR or US\$ considering the prevailing conversion rate on the date on which the Audited Balance Sheet and Profit & Loss Account is signed. A CA certificate is to be submitted by the bidder regarding converted figures in equivalent INR or US\$.
- A.2.5 In case the Bidder is subsidiary company (should be 100% owned subsidiary of the parent/ultimate parent/holding company) who does not meet financial criteria by itself and submits its bid based on the strength of parent/ultimate parent/holding company, then following documents need to be submitted:
- (i) Turnover of the parent/ultimate parent/holding company should be in line with Para A.2.1 of Annexure-B.
- (ii) Net Worth of the parent/ultimate parent/holding company should be positive in line with Para A.2.2 of Annexure-B.
- (iii) Corporate Guarantee (**PROFORMA-B3**) on parent/ultimate parent/holding company's company letter head signed by an authorised official undertaking that they would financially support their wholly owned subsidiary company for executing the project/job in case the same is awarded to them.
- (iv) Documents to substantiate that the bidder is as 100% subsidiary of the parent/ultimate parent/holding company.

A.3 COMMERCIAL:

Commercial Bid Rejection Criteria will be as per Section D of General Terms & Conditions of Global Tender (MM/GLOBAL/E-01/2005) with following Special Bid Rejection Criteria.

- A.3.1 The various documents required against BEC/BRC of the tender as specified under **Clause no. 11.0 of CC of Annexure-A** must be verified and certified (**signed & stamped on each pages**) by any one of the OIL's nominated Independent Inspection Agencies and submit the duly certified documents alongwith the Inspection Certificate (**PROFORMA-A6**) issued by the Inspection Agencies as part of their Technical Bids.

Bid submitted with un-verified supporting documents shall not be normally considered. However, in case a bidder submits its bid alongwith all relevant supporting documents against BEC/BRC without getting all/some of them verified by the designated Independent Inspection agency, such bid can be provisionally considered provided it is accompanied by an Undertaking by the Bidder on their official letterhead to submit the duly verified copies/verification certificate within seven (7) days of actual bid opening. Company will neither send any reminder nor seek any clarification in this regard from such bidders, and the bid will be rejected outright if the bidder fails to submit the verified copies/verification certificate within seven (7) days of actual bid opening at its own risk and responsibility.

- A.3.2 Bids are invited online under **Single Stage Two Bid System**. Bidders must prepare the Techno-Commercial Bid (Unpriced) as well as the Priced Bid separately and upload both these bids in OIL's e-procurement portal at the designated fields separately assigned. **Please note that no price details should be furnished in the Technical (i.e. Unpriced) bid.** The "Unpriced Bid" shall contain all techno-commercial details except the prices/costs. The rate and amount columns in the unpriced technical bid must be kept blank. The "Price Bid" must contain the price schedule and the bidder's commercial terms and conditions. Bidder not complying with above submission procedure will be rejected.

- A.3.3 The prices/rates offered against the tender must remain firm through delivery and not subject to variation on any account. A bid submitted with an adjustable price condition shall be treated as non-responsive and rejected. No discount whatsoever should be quoted separately. Rates/prices quoted must be net of all discount.

- A.3.4 Bids received in physical form against online invitation shall be rejected (except the documents specifically called for in hard copies, if any). Also, modifications to bids received after the bid closing date & time shall not be entertained.

- A.3.5 Bids containing incorrect/false/misleading statement(s) shall be rejected.

- A.3.6 Validity of the bid shall be **180 days** from the date of actual Bid Closing Date. Bids with lesser validity shall be straightway rejected.

- A.3.7 Bidders must confirm that goods/materials to be supplied against the order arising out of this tender shall be of recent make, unused, of the best quality & workmanship and free from defects. The Bidder must undertake to stand guaranteed the supplies for a period of twelve (12) months from the date of successful commissioning; against any defects arising from faulty materials, workmanship or design. Defective goods/materials rejected by OIL, whether the entire lot or part thereof, shall be replaced immediately by the supplier (on DDP Duliajan terms) at the supplier's expenses at no extra cost to OIL.

- A.3.8 Successful bidder shall be required to furnish a Performance Security equivalent to three percent (3%) of total LOA value within 30 days of receipt of LOA/notification of award. The Performance Bank Guarantee must remain valid throughout the period of execution, including extension if any. Non-submission of Performance Security as above by the successful Bidder shall lead to cancellation/termination of award including forfeiture of their Bid Security, besides other penal actions as per OIL's Banning Policy. Bidders should undertake in their bids to submit Performance Security as stated above.

Bidders should also undertake that in the event of AMC contract, the bidder will submit performance security @3% of annualized contract value valid for three months beyond entire execution period.

- A.3.9 Online Bid must be uploaded together with the Integrity Pact and the same must be duly signed digitally. If any bidder refuses to sign Integrity Pact or decline to submit Integrity Pact with the offer, their bid shall be rejected straightway.
- A.3.10 All the tendered items shall be procured from a single source. Bidders must submit their offer for all the tendered items & quantity. Evaluation of offers shall be based on total value of all the tendered items & quantity. Offers received for part items or quantity shall be rejected straightaway. Hence, bidders are requested to quote accordingly.
- A.3.11 Bidders are required to submit their price bids strictly as per the formats provided in **ANNEXURE-D1 (for Indian bidders)** and **ANNEXURE-D2 (for foreign bidders)**.
- A.3.12 Bidders shall accept and comply with the following clauses as given in the Bid Document, failing which bid shall be liable for rejection:
- i) Liquidated Damages
 - ii) Warranty/Guarantee of material
 - iii) Arbitration / Resolution of Dispute
 - iv) Force Majeure
 - v) Applicable Laws

B) BID EVALUATION CRITERIA (BEC) :

The bids conforming to the specifications, terms and conditions stipulated in the enquiry and considered to be responsive after subjecting to the Bid Rejection Criteria will be considered for further evaluation as per General Terms and Conditions for Global Tender and the Bid Evaluation Criteria given below:

- B.1 Bidders must submit prices as indicated in the price bid format provided in **ANNEXURE-D1 (for Indian bidders)** and **ANNEXURE-D2 (for foreign bidders)**.
- B.2 If there is any discrepancy between the unit price and the total price, the unit price will prevail and the total price shall be corrected. Similarly, if there is any discrepancy between words and figure, the amounts in words shall prevail and will be adopted for evaluation.
- B.3 For conversion of foreign currency into Indian currency, B.C. selling (Market) rate declared by State Bank of India, one day prior to the date of price bid opening shall be considered. However, if the time lag between the opening of the bids and final decision exceed 3(three) months, then B.C. Selling(Market) rate of exchange declared by SBI on the date prior to the date of final decision shall be adopted for conversion and evaluation.
- B.4 To ascertain the inter-se-ranking, the comparison of the responsive bids will be made as under, subject to corrections / adjustments given herein.

Note: 1) Domestic Bidders must quote inland freight charges upto Duliajan. In case bidder fails to quote inland freight charges, highest freight quoted by domestic bidder (considering pro-rata distance) against this tender or OIL's estimated freight, whichever is higher, shall be loaded to their offer for comparison purpose.

2) For enquiries with duty exemption benefit –

- a) The items covered under this enquiry shall be used by OIL in the PEL/ML areas and hence, applicable customs duty for import of goods shall be zero in case of Foreign Bidders. However, IGST @5% shall be applicable for imports.
- b) Indigenous bidder shall be eligible for concessional rate of GST @5% against Essentiality Certificate. Deemed Export Benefit shall be applicable to Indigenous offers with import content as notified by DGFT vide Notification No. 2015-2020 dated 05.12.2017 for Foreign Trade Policy and as amended time to time.

B.4.1 When only foreign bidders are involved:

The total value of (K) will be compared for evaluation.

- A) Total cost of Rigs including commissioning spares
- B) Total cost of mandatory spares (rig wise + common)
- C) Total basic Material Value (A+B)
- D) Total TPI & FOB Charges
- E) Total FOB Value (C+D)
- F) Total Overseas freight upto Kolkata
- G) Banking (@1% of E) & Insurance charges (@0.5% of E)
- H) Total CIF Value (E+F+G)
- I) IGST @ 5% against EC on H
- J) Total cost of "PDI + Installation/commissioning + Training + non-comprehensive AMC" including taxes
- K) Total Value (H+I+J)

NOTE:

- a) Banking charge in the country of the foreign bidder shall be borne by the bidder. Banking charge shall be 1% for payment through Letter of Credit/Sight Draft/Any other payment mode and 1.5 % if confirmed LC at buyer's account is required.
- b) Insurance charges @0.5% will be loaded as shown above.
- c) The items covered under this enquiry shall be used by OIL in the PEL/ML areas and hence, applicable customs duty for import of goods shall be zero in case of Foreign Bidders. However, IGST @5% shall be applicable for imports.
- d) If the Government of India revises these evaluation criteria the same as applicable on the bid closing date will be adopted for evaluation of the offers.

B.4.2 When only domestic bidders are involved or when more than one domestic bidders are in contention in case of mixed response:

The total value of (K) will be compared for evaluation.

- A) Total cost of Rigs including commissioning spares
- B) Total cost of mandatory spares (rig wise + common)
- C) Total basic Material Value (A+B)
- D) Total TPI & packing/forwarding Charges
- E) Total Ex-works Value (C+D)
- F) GST@5% against EC on E
- G) FOR Despatching station value (E+F)
- H) Total freight & insurance charges upto Duliajan including taxes
- I) Total FOR Duliajan Value(G+H)
- J) Total cost of "PDI + Installation /commissioning + Training + non-comprehensive AMC" including taxes
- K) Total Value (I+J)

B.4.3 When both foreign and domestic bidders are involved:

Total value (K) of B.4.1 for foreign bidder will be compared with Total value of (K) of B.4.2 (after removal of H i.e. freight & insurance) for domestic bidder.

Note: If the Government of India revises these evaluation criteria the same as applicable on the bid closing date will be adopted for evaluation of the offers.

B.5

Purchase Preference (if applicable):

- a) As per Gazette notification no. CG-DL-E-26062020-220191 dated 26.06.2020 issued by Ministry of Micro, Small and Medium Enterprises, MSE bidders whose quoted price is within price band of L1+15%, such MSE bidder shall be considered for award of contract by bringing down their price to L1 price in a situation where L1 price is from someone other than a MSE. In case of more than one such MSE qualifying for 15% purchase preference, the order shall be awarded to lowest eligible MSE amongst the MSEs qualifying for 15% purchase preference.

Or

- b) As per Purchase Preference Policy (linked with local content) as issued by Ministry of Petroleum & Natural Gas, Government of India vide notification no. FP-20013/2/2017-FP-PNG dated 17.11.2020, Class-I local bidder with local content equal to or more than 50% shall be eligible for purchase preference of 20%. Offer evaluation and award of order shall be based on the provisions of aforesaid policy. **For this purpose, the bidder must declare their percentage of local content in their technical bid unambiguously. In case bidder declares their local content in terms of range or in any other non-conclusive manner, the lowest value of bidder's local content shall be considered for determination of the class of the bidder.**

B.6

Other terms and conditions of the enquiry shall be as per General Terms and Conditions for Global Tender. However, if any of the Clauses of the Bid Rejection Criteria / Bid Evaluation Criteria (BEC / BRC) mentioned here contradict the Clauses in the General Terms & Conditions of Global Tender of the tender and/or elsewhere, those mentioned in this BEC / BRC shall prevail.

ANNEXURE-AA
TENDER NO. SDG8439P22/09

TECHNICAL SPECIFICATION & SCOPE OF WORK :: 2000 HP AC-VFD RIG

ANNEXURE - AA

TECHNICAL SPECIFICATION & SCOPE OF WORK :: 2000 HP AC-VFD RIG

SCOPE OF SUPPLY: Supply, Installation & Commissioning of 5 (five) numbers 2000 HP Variable Frequency Drive (VFD) Drilling Rigs with Top Drive and accessories.

CONTENTS

SECTION – 1	MAST & SUBSTRUCTURE AND CROWN BLOCK
SECTION – 2	HOISTING & ROTARY SYSTEM
SECTION – 3	PIPE HANDLING SYSTEM
SECTION – 4	MUD SYSTEM
SECTION – 5	POWER SYSTEM
SECTION – 6	RIG UTILITIES
SECTION – 7	FUEL SYSTEM
SECTION – 8	WATER SYSTEM
SECTION – 9	ELECTRICAL SYSTEM
SECTION – 10	RIG INSTRUMENTATION
SECTION – 11	INSTRUCTIONS / NOTES
SECTION – 12	GENERAL TOOLS
SECTION – 13	EQUIPMENT/CONSUMABLES SOBM
SECTION – 14	TRAINING

Appendices:

Appendix –AA-I: Drilling Control System; Appendix –AA-II: API Certificates; Appendix –AA-III: Third party inspection; Appendix –AA-IV: Installation & Commissioning; Appendix –AA-V: HSE Points.; Appendix –AA-VI: List of Mandatory Spares.; Appendix –AA-VII: Running hours of Caterpillar Engine for retrofitting; Appendix –AA-VIII: Foot print of CAT engines; Appendix –AA-IX: Typical Single Line Diagram, Appendix – AA-X : Electrical - Statutory Guidelines

	SECTION – 1: MAST & SUBSTRUCTURE AND CROWN BLOCK	
1.1	MAST & SUBSTRUCTURE AND CROWN BLOCK: MAST One (1) "Swing lift" Cantilever type Mast. Designed in accordance with latest API spec. 4F (PSL 2, SSL E2/U2, Proof Load Test as per SR2 to 100% of the rated hook load capacity). "Drilling and Well Servicing Structures". Mast should accommodate a 500 Short Ton (454 MT or 1000,000 lbs.) capacity top drive system. Mast shall be designed to meet the transportation dimensions using heavy duty oilfield truck/tractor/trailer (ref section 11.1) and shall be equipped with the following: <i>[Note: Bidder to provide Technical specification document/ catalogue containing all data /information as required in Tender clauses & schematic diagram of general arrangement in Mast with position.]</i>	
1.1.1	Mast Specification:	
	Design and monogramming	In accordance with API Spec 4F, PSL2, latest Edition.
	Mast Type	Cantilever type swing lift mast.
	Mast Raising	Hydraulic Cylinders.
	Mast clear height	Between 152-157 ft.
	Base width	Between 30 ft-35 ft.
	Static Hook load capacity	With 12 lines strung to the traveling block, min. 625 Short Ton (566.99 MT or 12,50,000 lbs.)
	Structural safety level (SSL)	E2, U2.
	Max wind load capacity (No load at set back)	90 mph

	Max wind load capacity with rated set back	80 mph
1.1.2	Four (4) no of sheave unit with swivel mounted beneath crown frame with bronze bushings as: • Two (2) Catline sheave • One (1) power tong sheave • One (1) Man Rider sheave	
1.1.3	Two (2) sets of compete Mast levelling equipment consisting of Hydraulic Jack of suitable capacity, Pump, Hoses, shims & other required accessories.	
1.1.4	Two (2) Counter weight system. Details at Section 1.15 (Hydraulic power tong)	
1.1.5	One (1) intermediate support frame (Belly board) including walkway and 3'-6" high handrails. Position of Belly Board to be at around 45 ft. (14 m) from Rig Floor. Rig name plate to be installed at Belly board level.	
1.1.6	Access platform (fold up) with safety belt rope connecting loop to be provided at: a) Standpipe gooseneck connection including ladder along mast leg (folded platform at all the Hammer union joint positions of Stand-Pipe). b) Sheave unit lubrication position.	
1.1.7	One (1) no. of height adjustable Mast stand equipped with lifting pad eye to support crown while pinning racking board with wooden block headrest.	
1.1.8	One (1) set of height adjustable mast assembly stands equipped with lifting pad eye to support mast section during assembly with wooden block headrest.	
1.1.9	Pad eyes mounted in mast to accommodate: a) Two (2) – 10 Short Ton (9 MT or 20,000 lbs) cat line sheaves b) One (1) – 10 Short Ton (9 MT or 20,000 lbs) for man rider c) One (1) – 10 Short Ton (9 MT or 20,000 lbs) for hydraulic power tong d) One (1) – 55 Short Ton (50 MT or 110,000 lbs) hang-off line for travelling block & TDS. e) One (1) – 55 Short Ton (50 MT or 110,000 lbs) hang-off TDS guide rails. Note: i) All pad eyes to be tested to one & half the SWL & certified according to relevant / applicable standards. All pad eyes to be painted safety yellow & marked with the SWL limit. ii) Bidder to mention sizes of wireline and sheave grooves	
1.1.10	One (1) block hanging line of suitable size, capacity and length (to match locking position of TDS) with adequate safety factor to hold the combined load of travelling block and TDS when slipping drill line, c/w all accessories.	

1.1.11	Hydraulic cylinders system for mast raising. Detail at Section 1.8 (Hydraulic cylinder)	
1.1.12	One (1) set of support material to mount deadline anchor on the mast bottom section as per OEM's design. Includes anchor bolts and working platform.	
1.1.13	One (1) set of full height straight ladder (complete with carrier rail, clamps, safety cage & two safety belts), with two rest platforms, between drill floor and monkey board. The ladder lengths should be equal to Mast Sections for ease of transportation.	
1.1.14	Two (2) sets of fall prevention system with complete provision for hooking up the same suitable for simultaneous use by two persons.	
1.1.15	Four (4) sets of Dual Stand pipe Clamps for 101.6 mm (4 inch) diameter standpipe to be provided on off-Drillers side of Mast complete with clamp cups & bolts.	
1.1.16	Mast sections shall be equipped with lifting eyes. Tested and certified.	
1.1.17	Lighting system: Each mast section should have an independent circuitry powered by a dedicated cable. All the light fitting's power receptacles on a particular mast section should powered by same cable. The aviation light at crown block should be part of the top most mast section circuit. The cables should be fixed to mast using easy to fit cable clamps which can be hand tightened. The clamp design should be such that cable fit into the groove and doesn't get damaged due to tightening. Two (2) area lights shall be placed on the lowermost horizontal beam of the mast and shall be directed towards rig floor for better illumination. For further details, refer to section 9 (Electrical Systems).	
1.2	<u>SUBSTRUCTURE:</u> Slingshot type substructure designed and manufactured in accordance with API 4F PSL2 specification, latest edition, complete with all bracing and support material while in erect position. The substructure shall be raised by hydraulic cylinders with adequate capacity for lifting all the equipment installed on to the derrick floor. The substructure shall be designed to meet the transportation dimensions using heavy duty oilfield truck/tractor/trailer. (Ref –as per Transport dimension & limitation design) Note: Technical specification document/ catalogue containing all data /information as required for Sub-structure in Tender clauses & Tentative Schematic diagram of general arrangement in Sub-structure with dimension.	
1.2.1	Substructure: Specification & Features	
	Design and monogrammed	In accordance with API Spec 4F, PSL2, latest Edition
	Substructure Type	Slingshot type
	Sub structure Raising	Hydraulic Cylinders

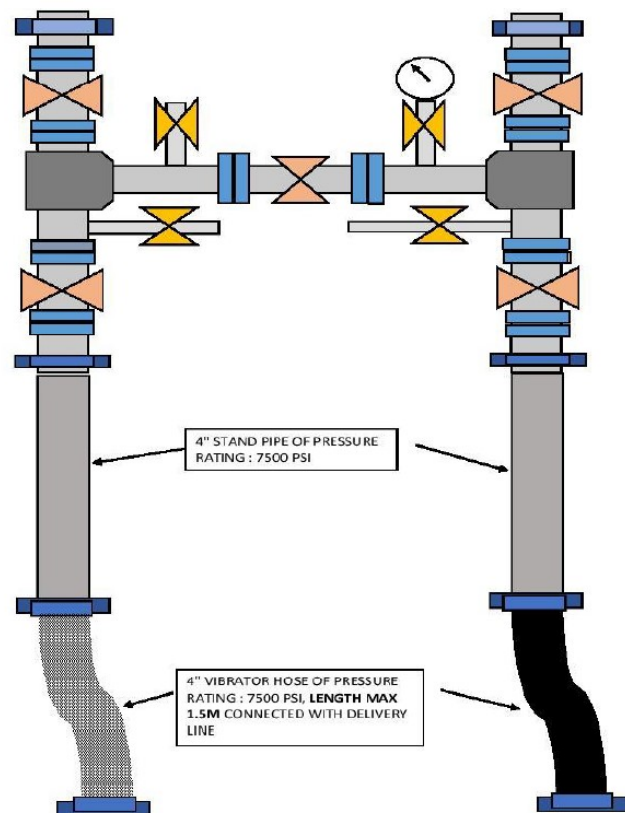
	Floor Height	Minimum 34 ft.
	Rotary clear Height	Minimum 29 ft.
	Minimum Floor Dimension	Length 35 Ft (10.67 M) x Width 40 Ft (12.19 M) (Excluding the Doghouse-cum-Driller cabin and ODS Tool Room)
1.2.2	Substructure Capabilities:	
	Setback	Minimum 350 Short Ton (700000 lbs)
	Rotary	Min. 650 Short Ton (1300000 LBS)
	Static Hook load capacity of Mast	Min. 625 Short Ton (1250000 lbs)
	The setback load is simultaneous with the hook load and or the rotary load.	
1.2.3	Equipment Accommodated: Rotary Table with IRD, Iron Roughneck, 2 nos. utility Air winch & 1 no Man rider winch, 2 nos. Hydraulic Cathead. (Positions of Draw-works and HPU as per OEM design)	
1.2.4	Hydraulic cylinder system for sub structure raising. Details at Section 1.8	
1.2.5	Min. Four (4) high lumen area lights (minimum Illumination level to be maintained) to provide enough illumination below substructure area. For further details, refer to section 9 (Electrical Systems).	
1.3	CROWN BLOCK: One (1) 650 Short Ton (1,300,000 lbs.) capacity Crown Block Assembly conforming to API Specification 4F & consisting of:	
1.3.1	Working cluster consisting of at least six (6) nos. of sheaves, of minimum 60" diameter & grooved for 1.½" diameter wire line complete with tapered roller bearings. Shaft drilled with greased fitting for each bearing with grease seals. Sheaves to be manufactured and monogrammed as per API 8C, PSL-2, latest edition.	
1.3.2	One (1) no. of fast line sheave of minimum 60" diameter with bearing shaft and grease seals. Sheaves to be manufactured and monogrammed as per API 8C, PSL-2, latest edition.	
1.3.3	One (1) set of bumper blocks of wood or other suitable material fitted in the crown block for safety.	
1.3.4	Line guards complete with sheave guard.	
1.3.5	Crown safety platform with checker plate flooring with at least 1 m (3'6") high handrails and toe plates, safety gate at ladder opening, and frame lifting eyes.	
1.3.6	Suitable crown pulley greasing system with pneumatic actuation from Rig floor.	
1.3.7	Suitable arrangement for lowering crown block sheaves when the mast is in erect position.	
1.4	RACKING PLATFORM:	

	a) Heavy duty racking platform with a capacity for 220 stands (in thribble) of 5" Drill pipe of Range-II, and 8 stands (in triples) of 8" drill collar and 4 stands of 9 ½" drill collars (in thribble). The length of each single will be in the range of 9.14 M to 9.44 M (30 ft. to 31 ft.) & hence the thribble's length will be 27.43 M to 28.35 M (90 ft. to 93 ft.). Adjustable Height of Racking Board from Drill-floor to be preferably in the range 82 ft. to 88 ft. b) Height adjustable Platform shall be complete with access walkway on driller's side platform with 7'-0" high Hand rails with toe-plates (guards). It should have foldable centre diving board with at least 1 M (3'6") high Handrails & toe plate on three sides and hinged extension with bracket to accommodate pullback winch. c) One (1) Escape line, including wire line, clips, thimbles and hand brake for emergency dual escape from racking board with complete provision for hooking up the same. One (1) Sure-Lock retractable lifeline complete with ground brackets to be mounted above diving board. (Escape device landing preferably towards Cat-walk side.) d) Emergency Dual Escape device for safe sliding down of persons from Racking board during emergency condition. The Device includes Track line or life line, of minimum 12 mm diameter construction of stranded 6x19 & haulage line of minimum 6 mm diameter construction of stranded 6x19, Chair unit with seat belt, suitable hand brake system along with speed control system, anchoring arrangement just above Diving board & ground anchoring devices with suitable Shock absorber for cushioning hard landing. Components/materials used in the device shall conform to relevant BIS/ISO/OISD/Internationally accepted standard. Emergency escape device shall be tested for its accuracy; safe working & reliability conform to BIS/API/OISD/ISO or equivalent internationally accepted standard.
1.5	STAIRS, HANDRAILS & ESCAPE SLIDE:
1.5.1	One (1) Stairway from doghouse skid to ground. Landing platform at mid-level.
1.5.2	One (1) Stairway complete with intermediate landing to extend from the drill floor level to the shaker tank area.
1.5.3	One (1) set/lot of removable handrails 3.5 ft high with 230 mm high toe plate (guard) shall be provided for drill floor perimeter.
1.5.4	Two (2) strong pull back post on either side of the V- door with two safety chains.
1.5.5	One (1) Escape slide for fast evacuation from Derrick floor in case of emergency to be provided on Driller`s side
1.5.6	All Stairs shall have chequered plate steps with anti-skid metal strip topped up with anti-skid mat including heavy duty anti slip stair nosing & removable handrails. Stair width: 4'
1.6	V-Door Ramp & Stairs:

1.6.1	One (1) V-door ramp from 10.67 M (35 ft.) high rig floor, 1.8 M (6 ft.) wide with 12.7 mm (½”) thick plate down to the 1066.8 mm (42 inch) high catwalk elevation with framing and stairs continuing to ground level & complete with 76.2 mm (3 inch) diameter x 0.61 m (2 ft.) high pipe rail on both sides of the ramp adjacent to the stairs. The stair should be located on the Drillers Side with fixed handrails on one side away from the ramp.	
1.6.2	The V-door ramp shall in no way hamper the lifting operations of tubulars from the Catwalk. The stairs located on the driller’s side of the ramp shall have 1 m (3’-6”) removable handrails.	
1.6.3	V-Door Ramp should be compatible with the catwalk.	
1.7	DOG HOUSE & DRILLER CABIN AND TOOL ROOM SUPPORTS:	
1.7.1	Two (2) sets of folding floor modules supports to accommodate Dog house integrated with driller’s cabin on Drillers side. (Ref-Driller cabin)	
1.7.2	Tool room on Off-Drillers side each on two supports. Support pins to Drillers and Off-Drillers side floor elevator boxes. (Ref-casing spooler)	
1.8	<u>HYDRAULIC CYLINDER FOR MAST AND SUBSTRUCTURE:</u> The raising of Mast and substructure shall be with Hydraulic Cylinders. Advanced hydraulic cylinders shall be failsafe, multistage, double acting, corrosion resistant, as per the rig design. Additional fail save device to be also provided (Mechanical Stopper).	
1.8.1	Hydraulic Cylinders Specification	
	Stages	Multi stage (Max. Three stage) double acting hydraulic cylinder. All stage retractable. Oil supply on barrel
	Nominal pressure	3000 psi (in accordance with working pressure).
	Test pressure	4500 psi(in accordance with working pressure)
	Working pressure	2500 psi (minimum)
	Tang with spherical ball joint on the barrel and rod end (or as per design requirement).	
	Cylinder design to meet requirements from API specification 4F Latest edition. [Section 8.1.5 Hydraulic cylinders for Mast and substructure erection of API 4F.]	
	Pressure testing to be performed according to API specification 4F Latest edition [Section 11.8.4. Cylinders and winches of API 4F.]	

1.8.2	Hydraulic Unit: Shall consist of 2 Nos. hydraulic pump unit separately driven with engine & electric motor having motor starter panel. The hydraulic pump shall have positive displacement gear/rotary pump, hydraulic oil reservoir, NRV / filters complete with suction and delivery lines. Pressure and volumetric requirement of the hydraulic unit shall match hydraulic cylinders. The engine & motor driven hydraulic pump shall be connected through suitable power transmission mechanism so that the hydraulic pump can be engaged and disengaged as and when required. The engine & motor BHP shall match the maximum hydraulic HP of the Gear Pump. The hydraulic unit shall have relief valve & lines to relieve pressure to reservoir tank. All delivery hydraulic lines shall withstand more than 10% MWP of the hydraulic pump. The unit shall be independent & separate from common hydraulic power unit. A common robust manifold complete with HP valves mounted on oilfield skid to be supplied and connected to both the hydraulic pump unit. Make of Hydraulic Pump: Chelsea Parker / Rexroth / Danfoss / Parker Hannifin. Technical literature containing details of specification & working to be submitted. The electric motor shall have Ex. Certification for use in hazardous areas of drilling rigs. For details refer to section 9 (Electrical systems).
1.8.3	Hydraulic cylinders should be operated from both unit and wired/wireless remote operation panel.
1.8.4	Hydraulic cylinders should be retracted and parked in sub structure after mast and sub structure up/down operation.
1.9	<u>DEAD LINE ANCHOR:</u>
1.9.1	One (1) Dead line anchor designed, manufactured and monogrammed to API specification 8C PSL-2 latest edition. and should be with tension/ compression load cell (weather proof) to provide a signal for the Weight Indicator System, preferred location at Mast bottom structure. In addition to Load cell, the system shall include Weight Indicator at Driller's Console for 10 to 12 line strung & accessories / fittings. Dials of Weight Indicator should be in Metric unit KG & also in pounds.
1.10	<u>4" x 7500 psi Dual Standpipe - 60 ft.:</u> Dual 4" x 7500 psi standpipe x approximately 60' (ft.) long; each complete as follows-
1.10.1	4" Weco Fig 1003, 7500 psi butt weld hammers union at bottom connection, standard service. 4" Weco Fig 1002, 7500 psi butt weld hammers union at top connection, standard service.
1.10.2	4" x 7500 psi gooseneck 160-degree, standard service.
1.10.3	(4"x 4") x 7500 psi butt weld swages for Weco unions, standard service.

1.11	<u>Dual Standpipe Manifold - "H" Style, 7500 psi:</u> (Refer Fig in section 1.11 of Technical Specs.) Mandatory spares: As per Appendix – AA-VI
1.11.1	Five (5) Nos. of 4" flanged gate valves Max WP 7500 Psi
1.11.2	Two (2) Single end 2" screwed end gate valves Max WP 7500 Psi
1.11.3	Two (2) 4" x 4" long sweep full flow TEE (Sch.160)
1.11.4	Four (4) 4",7500 PSI (527 kg/sq-cm) WP misaligning union fig 1003 for standard service
1.11.5	Ten (10) RTJ weld neck flanges 4" 7500 PSI (527 kg/sq-cm) bored for 4" SCH. 160 pipe with ring gaskets.



	GATE VALVE, SIZE: 2", PRESSURE RATINGS: 7500 PSI SCREWED END		RTJ Flange
	4" GATE VALVE, MWP 7500 PSI WITH RTJ FLANGE		Hammer Union FIG 1003, 4"
	2" PRESSURE GAUGE OF RATING 7500 PSI		

FIG (B) : SCHEMATIC DIAGRAM OF JUNCTION MANIFOLD (VIEW FROM DRILLER CONSOLE)

1.11.6	Two (2) 4"x 2" threads lets for pressure gauge and mud service connection with 2" screwed end gate valves Max WP 7500 Psi
1.11.7	One (1) standard Kill line kit (as per Rig Manufacturer design) consisting of a suitable length of XXS pipe (around 150 Mtrs.), swivel joints & integral unions.
1.11.8	One (1) 9.14 M (30 ft) long HP hose of 3000 Min WP with 2" Fig 1002 Integral union at each end for Hole Fill Line.

1.11.9	Two (2) 2" 7500 PSI (351 Kg/sq-cm/527 kg/sq-cm) Plugs
1.11.10	One (1) 0-6000-10000 PSI gauge, type D, 2" Female
1.11.11	Y connector change over adapter (2 female 1 male) to be supplied separately
1.11.12	Required pipe nipples, nuts and bolts
1.11.13	Forged reducing block Tee, 4" x 2" for cementing purpose
1.12	CEMENTING LINE:
1.12.1	One (1) single 2" XXS 15,000 psi cementing line including gooseneck and 2" Fig 1502 Integral union at gooseneck as per Rig Manufacturer design.
1.13	VIBRATORY HOSE:
1.13.1	Three (3) number 3.1/2" ID x 5 Ft, vibratory hose Grade E, 7500 PSI WP AND 11250 PSI TP with Fig 1003 integral union (male & female welded) & hose hobbles (both ends). Manufactured & monogrammed according to API 7K.
1.14	ROTARY HOSE:
1.14.1	Two (2) 3.1/2" (88.9mm) ID, 7500 PSI Working Pressure and 11250 PSI test pressure, Grade E rotary hoses with 4" Fig 1002 Integral Union (Male x Female) with Safety Clamp and Chain (on both ends). Sufficient length to ensure smooth operation. Manufactured and monogrammed according to API spec 7K. (Bidder to confirm the length in their technical bid).
1.15	TONG AND HYDRAULIC POWER TONG COUNTER WEIGHT:
1.15.1	Two (2) numbers of tong counterweight buckets / Wafer style mounted on mast leg & complete with guides, snatch blocks, wire lines, minimum replaceable counter weight of 10 kg each totalling 100kg for each bucket
1.15.2	One (1) hydraulic power tong counterweight bucket/ Wafer style, guide and sheave unit, located at convenient with minimum replaceable counter weight of 10 kg each totalling 200kg.
1.16	<u>DRILL FOOR:</u>

1.16.1	One (1) set of drill floor panels with 8mm thick checkered plate for the substructure and 3/8" (10mm) thick checkered plate along the rotary area. Drill floor should be complete with handrails 1m (3'6") high with toe plates for the perimeter of the drill floor. All the checkered plates should have numbers engraved on it. Most of the drill floor panels, hand rails and floor mounting equipment to be set in to position at ground level and raised with Draw works & setback support Note: The area for set back of tubulars (both ON & OFF Driller side) on the derrick floor to be provided with Set-Back safety mats which should be resilient and tough to withstand the weight of drill pipes and drill collars. Additionally the safety mats should be able to withstand the tough working environment of drill fluids – water base & oil base mud, salt water and other oil field chemicals and lubricants.
1.16.2	A minimum of four (4) lifting rings/slots for each section of the drill floor panel to be provided.
1.16.3	Outside exterior of flooring to have around ¾" lip to contain the spillage from pouring outside of the rig floor.
1.16.4	Rotary table to have a 2" gap around perimeter covered with bar grating for drainage
1.16.5	Should have built in Drill floor fluid containment system.
1.16.6	Two strong pull back post on either side of the V- door with two safety chains.
1.17	<u>ANTI-SLIP MATING:</u>
1.17.1	One (1) Set of anti-slip vinyl / rubber matting (minimum thickness 8 mm) fixed over the flooring for working area of around 3 feet (914 mm) circumferentially on floor all along the rotary table.
1.18	<u>ROTARY SET BACK SPREADER:</u>
1.18.1	One (1) rotary/setback spreader complete with framed mouse hole opening, and recess to accommodate 6" (152mm) thick timber (or canvas reinforced rubber composite) over 3/8" (9.5mm) flat plate.
1.18.2	Pin tabs are equipped with drop through stops (safety locks)
1.18.3	The setback support should be designed to support at least 375 Short Ton or 700,000 lbs of racked pipe simultaneously with 650 Short Ton OR 1300,000 lbs) of casing load on rotary (Rotary Load).
1.19	<u>GRASSHOPPER/CABLE ELEVATOR:</u>
1.19.1	One (01) metal construction-folding grasshopper/Cable elevator shall be provided for supporting utility & cables up to Derrick floor. The cable elevator shall be of sufficient width to accommodate all power/control cables with no overlapping on one another and having better stability. Elevator must have top covers with steel sheet to protect the cables. Separate channel shall be provided for running signal cables along the elevator to avoid unwanted signal distortion problem from power cables. For details refer to section 9 (Electrical systems).

1.19.2	Grasshopper cable rack suitable for elevating with derrick floor shall be used for leading and supporting draw works, top drive cables including control, lighting, and auxiliary motor cables. Grass hopper shall have sufficient cable storage area for coiling cables lying beyond cable extender towards derrick floor (if any), during rig movement. For details refer to section 9 (Electrical systems).
1.20	<u>MOUSE HOLE</u>
1.20.1	One (1) Mouse hole assembly - 12" diameter x 30' long with a stopper at 27 feet featuring spring rubber tool joint protector (including Mouse hole clamping mechanism).
1.21	TOOL ROOM
1.21.1	One (1) tool room at ODS not less than 3.66 m (12 ft.) long X 2.44m (8ft) wide X 2.44m (8ft) high.
1.21.2	Tool room mounted on a 3-runner skid with load rolls.
1.21.3	Exterior side panel fabricated of 4.76mm crimped wall panels and top of skid deck covered with 6.35mm (1/4") chequered plate.
1.21.4	Tool Room should be complete with
1.21.4.1	One(1) personnel door
1.21.4.2	One(1) window to view well
1.21.4.3	One(1) window to view exterior
1.21.4.4	One(1) ladder for roof access
1.21.4.5	Four(4) tool box along the length of tool room
1.21.4.6	All interior light fittings shall have Ex. Certification for use in hazardous areas of drilling rigs.

1.21.4.7	One (01) number 1.5T capacity air-conditioner with Ex. Certification for use in hazardous areas of drilling rigs.
1.21.4.8	Four (4) numbers 16A capacity spare receptacles with Ex. Certification for use in hazardous areas of drilling rigs.
1.22	<u>FALL ARRESTER WITH FULL BODY HARNESS:</u>
1.22.1	Two (2) Self retracting lifeline with 20 M (65 ft) of 3/16" galvanized cable and a fall arrest body harness
1.23	MAST LADDER RAIL SAFETY CLIMB SYSTEM WITH CLIMB ASSIST/ FALL ARREST SYSTEM.
1.23.1	One (1) Mast Ladder Rail Safety Climb System to climb up to Crown block with two (2) Climb Assist/Fall Arrest System
1.24	DRILLING/CASING LINE:
1.24.1	One (1) reel / spool of 1 ½" drilling/casing line, 6X19, Right Regular Lay, IWRC, IPS, length approximately 1524 M (5000'), conforming to API Spec. 9A latest edition & with API monogram embossed.
1.25	CASING LINE SPOOLER:
1.25.1	One (1) electrical motor / Hydraulically operated drilling line spooler, Capacity: not less than 1524 M (5,000 ft.) of 1½" diameter wire rope, designed to spool, unspool and store drilling line. Hydraulically operated spooler must be provided with an independent hydraulic unit. Electric motor shall have Ex. Certification for use in hazardous areas of drilling rigs. For details refer to section 9 (Electrical systems) areas of drilling rigs.
1.25.2	Features: The steel spool of wire rope is installed on the spooler shaft where it is driven by adjustable pins. Provision for easy removal and installation of the spooler shaft for wire rope spool replacement. It shall have provision to disengage the spool for free wheel. The spooler shaft and drive assembly is mounted on a heavy-duty structural steel frame. Lifting lugs and tie-down boltholes are provided on the spooler frame for handling and field installation. The unit shall be operated from controls on spooler.

	SECTION – 2: HOISTING & ROTARY SYSTEM
2	HOISTING & ROTARY SYSTEM
2.1	500 Short Ton Top Drive System (TDS)
2.1.A	500 short Ton Top Drive System (TDS): Components
2.1.A.1	Integrated Swivel assembly with 7500 psi wash pipe, A.C. drilling Motor (s) with carriage along with the housing, gear and brake assembly
2.1.A.2	Forced Air-cooled Motor and Gear Box cooling system.
2.1.A.3	Guide beam system (As per Rig Manufacturer design).
2.1.A.4	Remote controlled pipe handler assembly
2.1.A.5	Counter balance /weight compensating system
2.1.A.6	Integrated Top drive Driller 's console for all functions of TDS
2.1.A.7	Complete power cable, control cable and junction box
2.1.A.8	Integrated Electrical control system
2.1.A.9	Mud goose neck

2.1.A.10	Mud hose of required length – 2 nos. Details at Section 1.14 (Rotary hose)	
2.1.A.11	Drag Chain System for TDS cables and hoses	
2.1.A.12	IBOP shall be provided with TDS along with software integration with drilling control system.	
2.1.A.13	TDS has to be compatible with online monitoring system	
2.1.A.14	API Monogram: Vendor/ Manufacturer to possess valid API license and API monogram and API marking to be applied on the equipment (Power Swivel) in accordance with API-8C, PSL-1 (or higher).	
2.1.A.15	Top Drive Hydraulic Power Unit (HPU): Must be On-board the TDS.	
2.1.B	500 Ton Top Drive System (TDS): Specification	
2.1.B.1	Drive Motor: AC Motor(s) of suitable capacity and suitable for use in hazardous areas of drilling rigs. The motor speed control is through variable frequency drive with necessary controls. For details refer to section 9 (Electrical systems).	
2.1.B.2	Torque and Speed	
	Continuous Torque	50,000-56,000 ft.-lbs (minimum) at 90 or above RPM
	Torque at Max. Speed	20,000 ft. lbs (minimum)
	RPM range	0 - 220 RPM (minimum)
	Break out torque	75,000 ft. lbs (minimum)
	Tubular Range	2-3/8" – 6 5/8" nominal pipe diameter
2.1.B.3	Hoisting & Rotating	500 Short Ton.
2.1.B.4	Water Course	3 In.
2.1.B.5	Pressure Rating	7500 psi
2.1.B.6	Upper IBOP	15000-psi WP with hydraulic remote actuator
2.1.B.7	Lower IBOP	15000 psi WP with saver sub (bottom connection 4 ½- IF Pin)

2.1.B.8	Mud goose neck fitted with hammer union to suit fitting of rotary hose with 4" Fig 1002 Number hammer union, with a 2 or 3-inch Top port for emergency wire line operations.	
2.1.B.9	Wash pipe should be easily replaceable.	
2.1.B.10	Lubrication	Force fed, Filtered, Air Cooled
2.1.1	ELECTRICAL PACKAGE	
2.1.1.1	Power and Service Cable Termination should preferably be on the RH side of the Top Drive. Solenoid Valves are operated with 24 Volts DC Power. All auxiliary electric motors shall be 415 Volts, 3 phase, suitably rated, TEFC and shall have Ex. Certification for use in hazardous areas of drilling rigs. For details refer to section 9 (Electrical systems).	
2.1.1.2	Electrical system (including VFD Drives) of TDS may be accommodated in the VFD house (PCR-1/PCR-2) or in a separate Power Control Room (Without increase in total size of VFD house). For details refer to section 9 (Electrical systems).	
2.1.1.3	The top drive cables shall preferably be laid along the Off-Driller Side Mast structure to facilitate easy handling (laying /dismantling) of cables during Rig Up/ Rig Down. The Top drive cable joint/ connections (on the mast) shall be arranged such that laying and connections of the top drive cable can be completed prior to mast up (i.e. while the mast is in horizontal position). All in-line joints/ connections provided on the top drive cables shall be of Ex-d type.	
2.1.2	CARRIER PACKAGE	
2.1.2.1	Package should include a Carrier (Frame) with rollers for guiding the TDS in the Guide Beam and for reacting torque from the TDS to the Guide Beam. Also to include the hardware to secure the carriage to the TDS and locking dogs to secure the TDS in the Shipping Skid. Well-designed round type container for transportation of power and service cables and service hoses of TDS.	
2.1.3	PIPE HANDLER PACKAGE	
2.1.3.1	Also to include in the package are one Upper IBOP valve, one Lower IBOP valve and one Saver Sub for an NC50 API RH tool joint complete with Locking Rings for the API 6-5/8" Reg connection.	
2.1.3.2	The Clamping Mechanism can be positioned to provide Back-Up for removal and installation of the Saver Subs, Lower IBOP Valve and Upper IBOP Valve. The package to be configured with IBOP Valves with H2S Trim and for use with 350 /500 Ton Elevator Links	

2.1.4	S-PIPE PACKAGE:
2.1.4.1	Package should include a 7500-psi capable S-Pipe preferably with 20-degree elbow. The connection for the Rotary Hose shall be a female, 4-inch Fig 1002 Union. Pressure rating of the package, as assembled at the factory, shall be 7500 psi. The Rotary Hose connection shall be on the Right Hand side of the TDS (viewing TDS from the front) and positioned toward the front of the TDS.
2.1.4.2	The Elbow shall have an upper connection to the S-Pipe that is a 4-inch Fig 1002 Union with the Female half being on the S-Pipe. The Elbow can be removed to have a 4" Female Fig 1002 Union pointing straight down for connection of the Rotary Hose directly to the S-Pipe.
2.1.5	CASING RUNNING TOOL (CRT): One (1) Casing Running Tool (Preferred Make: National Oilwell Varco, Baker Hughes, Tesco or Weatherford), for lowering casing of sizes 4-½" to 9-7/8" by connecting to the Top Drive System main shaft. The casing running tool (CST) should be able to hoist, lower, spin out and make up the casing connection. It should also have the ability to fill up and rotate the casing string while circulating.
SYSTEM COMPONENTS:	
2.1.5.1	Hoist and Torque Tool.
2.1.5.2	Adjustable Link-Tilt Frame.
2.1.5.3	Pipe Weight Compensator.
2.1.5.4	Pipe Sensor.
2.1.5.5	Single Joint handling assembly (Hydraulically operated single joint elevator, cylinder assembly for link tilt / Link tilt assembly, frame for housing the components).
2.1.5.6	Hydraulic / Air Swivel
2.1.5.7	Fill up and Circulating Tool
2.1.5.8	CRT Monitor.

2.1.5.9	Hydraulic Controls and Hydraulic Power Unit preferably to be Rig central Hydraulic unit	
2.1.5.10	Hoist and Torque Tool.	
SPECIFICATION:		
2.1.5.11	Hoist Rating (API 8C)	500 short ton
2.1.5.12	Casing Size	4-½” to 9-7/8”
2.1.5.13	Fill Up and Circulation	4.1/2” to 9-7/8” Fill up & circulation
2.1.5.14	Maximum Circulation Pressure	5000 psi
2.1.5.15	Rotational Speed	0 – 20 RPM
2.1.5.16	Maximum Push down Force	5,000 psi / 34,500 kPa 5,000 psi for 4-½” to 5-½” casing
2.1.5.17	Maximum Torque	35,000 ft.-lbs.
2.1.5.18	Compensator Capacity @ 90 psi air supply	8,500 lbs (3,900 Kg)
2.1.5.19	Link Tilt out distance	15 ft. (4.5m)
2.1.5.20	Shaft Connection	NC50 (4-½” IF) API RH Box
2.1.6	BAIL PACKAGE:	
2.1.6.1	Package should include an API 500T Swivel Bail, Bail Pins with retaining devices, Bail Pin Bushings and Counterbalance Cylinder Mounting Brackets	

2.1.6.2	All components should be factory installed on the TDS
2.1.6.3	Bail to be used for direct coupling to a Travelling Block
2.1.7	SHIPPING PACKAGE:
2.1.7.1	Shipping package should include lower section of guide beam integrated into a shipping skid, shipping support for pipe handler and shipping / lifting bar for TDS bail. Shipping skid should be suitable for tail boarding and includes lifting shackles. Cylindrical metal containers should be provided for TDS cable transportation during every rig movement.
2.1.8	TOOL KIT:
2.1.8.1	Tools and accessories required for the installation, dis-assembly, maintenance and repair shall be supplied with the TDS.
2.1.8.2	Package shall also include a Lower IBOP Hex Wrench, Valve Seat Wrench and Valve Seat Puller, 2 sets of the following per rig to be supplied by the bidder: Pressure checking kits, tubing replacement tools according to size of hydraulic tubings, o-ring replacement kits, accumulator charging tool kit.
2.1.8.3	Includes TDS gear box lubricant, hydraulic system fluid and hand pump for standard service.
2.1.9	U-BOLTS & CLAMP FOR 350 TON & 500 TON ELEVATOR LINK:
2.1.9.1	Set of U-Bolts for accommodating 350 Ton and 500 Ton capacity Elevator Links
2.1.9.2	Clamp for accommodating 350 Ton and 500 Ton capacity Elevator Links
2.1.10	WELDLESS LINKS (API MONOGRAMMED: API SPEC 8C):
2.1.10.1	One (1) pair of 350 Short Ton (317 MT) Capacity Weld less Links, 2-3/4" x 168" (70 mm x 4267 mm)
2.1.10.2	One (1) pair of 500 Short Ton (454 MT) Capacity Weld less Links, 3-1/2" x 168" (89 mm x 4267 mm)
2.1.10.3	One (1) pair of 350 Short Ton (317 MT) Capacity Weld less Links, 2-3/4" x 132" (70 mm x 3352.8 mm)
2.1.10.4	One (1) pair of 500 Short Ton (454 MT) Capacity Weld less Links, 3-1/2" x 132" (89 mm x 3352.8 mm)
2.1.11	MANDATORY SPARES:
2.1.11.1	i) Wash pipe assembly with Five (5) sets of packing ii) TDS saver sub (NC50) iii) Hydraulic oil filter

	iv) Gear oil filter v) Upper & Lower IBOP repair kit. Note: Quantity as per Appendix-AA-VI	
2.2	TRAVELLING BLOCK: One (1) 500 Short Ton (454 MT or 1,000,000 lbs) capacity travelling block conforming and monogrammed to API Specification 8C PSL 1 latest edition & with following features and specification:	
2.2.1	Travelling Block Features:	
2.2.1.1	Heavy Steel Fabricated Main frame	
2.2.1.2	Heavy wire line Guards	
2.2.1.3	Steel Sheaves with Induction Hardened API Wireline Grooves (Fatigue designed sheave fatigue class E8)	
2.2.1.4	Quenched and tampered alloy steel shaft	
2.2.1.5	Individual grease passage to each centre pin/shaft bearing	
2.2.2	Travelling Block Specification:	
2.2.2.1	Load Capacity	500 Short Ton (454 MT or 1,000,000 lbs)
2.2.2.2	Lift eye Capacity	65 Short Ton (59 MT or 130,000 lbs)
2.2.2.3	Number of Sheaves	6
2.2.2.4	Minimum Sheave Dia.	1524 mm (60") Approx.
2.2.2.5	Wire line size	1 ½"
2.2.2.6	Coating	Three Coat Epoxy Paint System
2.3	AC-E-2000 DRAWWORKS:	
	One (1) 2000 HP AC variable frequency drive (VFD) Draw-Works conforming to API 7K with under-noted features /specification Primary/dynamic braking to be performed with AC motors by dissipating power into braking resistors. The motor and frequency drive should be capable of holding full load at zero speed. Load and speed is limited within motor capacity by the control system. A pneumatically operated multi-plate disc brake system should be provided for parking and emergency situations; consisting of multi-plate water / air cooled discs with spring applied brake, static braking by springs expanding & forcing all the brake discs together (fail safe). The brake assembly is to be mounted to the end of the drum shaft & secured to the drum support uprights.	

	This multi-plate disc brake system should be operated remotely via the draw-works control system. Emergency brake controls on the draw-works should allow the load to be manually lowered using the multi-plate disc brake system. Bidder to confirm the position of draw works (Bidder to refer section 11.1 for weight of the draw works so that draw works can be transported as a single unit with disc brake) Note: Following spares per rig to be supplied. 1) Lube & gear oil filter, 2) Kick back roller, 3) Casing line spooler Note: Quantity as per Appendix-AA-VI	
	Draw works Specification & Feature:	
2.3.1	Rated Horsepower	2000 HP minimum
2.3.2	Drive motors	Two AC VFD motors each of minimum 1100 HP capacity and suitable for use in hazardous areas of drilling rigs. For details refer to section 9 (Electrical systems).
2.3.3	No. of Drums	One
2.3.4	Drum size	30"X 55" or above
2.3.5	Grooving	Lebus Type grooved for 1 ½" wire line
2.3.6	Hoisting Capacity (min)	500 Short Ton (454 MT or 1000,000 lbs) with 12 lines
2.3.7	Transmission	Direct gear drive
2.3.8	Auxiliary brake	One friction type, multi-plate, air/ water cooled Disc Brake with locking device
2.3.9	Main brake	Dynamic Braking System
2.3.10	Crown & floor saver	Electronic systems for preventing accidental hitting crown block and rig floor by the travelling block and pneumatic Crown-O-Matic type crown saver system with proximity sensor integrated with drilling control software. Mechanical arrangement for crown saver in addition to electrical arrangement will be preferred (toggle valve). Bidder to submit detailed note on Electronic Crown & Floor saver arrangement or Anti-collision device. Additionally Mechanical arrangement for Crown-saver also to be included in the note.

2.3.11	Lube system	Two (2) Lube oil pumps driven by electric motors (minimum 3HP, 415V, 3 Ph, 50Hz and Ex. Certified for use in hazardous areas of drilling rigs) along with oil filtering and cooling system. For details refer to section 9 (Electrical systems).
2.3.12	Auto Driller system	The Draw works must have standard integrated 'auto driller' features with HMI control. The 'auto driller' should have provide the following features and benefits. Auto Drill • As per pre-set desired Weight on Bit • As per pre-set desired rotating torque. • As per pre-set desired rate of penetration. • As per pre-set desired differential pressure.
2.4	ROTARY TABLE:	
	Rotary table Specification & Feature (Manufactured, Tested and Monogrammed as per API 7K)	
2.4.1	Opening	37½" (952.5 mm)
2.4.2	Static Load Rating	650 Short Ton (590 MT or 13,00,000 lbs)
2.4.3	Max. Speed	Desired speed with 2 nd gear: 300 RPM or more Desired speed with 1 st Gear: 150 RPM or more.
2.4.4	Centre line spacing	53.1/4" (1352.55 mm)
2.4.5	Max output torque	Desired Torque with 1st Gear: Not less than 26,000 ft.-lbs Desired Torque with 2nd Gear: Not less than 13,000 ft.-lbs.
2.4.6	Gear ratio	Dual speed & 3.6:1
2.4.7	Rotary Drive gearbox - Speeds	2 speed
2.4.8	Rotary table mat	Mats to be durable and resistant to the fluids encountered in the oil & gas industry.
2.5	INDEPENDENT ROTARY DRIVE SYSTEM:	
	One (1) suitable independent rotary drive for 37½" rotary table complete with AC Motor, suitable drive system, Inertia Disc Brake for IRD Component & full guard.	

	Specification	
2.5.1	Transmission	Two speed transmission.
2.5.2	Brake system	Disc brake
2.5.3	Rated power	Minimum 1100 hp
2.5.4	Cooling type	Air forced ventilation 3200 cfm @ 8 inch WC
2.5.5	Rated voltage:	For details refer to section 9 (Electrical systems).
2.5.6	Following spares per rig to be supplied. i) Drive chain for IRD Note: Quantity as per Appendix-AA-VI	
2.6	MASTER BUSHING, INSERT BOWLS, SPLIT CASING BUSHING, BIT BREAKERS:	
	The following items compatible with 37 ½" rotary table shall be supplied: Master Bushing, Insert Bowls, Split Casing Bushing (Manufactured and Monogrammed as per API 7K) and Bit Breaker	
2.6.1.	One (1) split body pin drive master bushing for 37.1/2" Rotary Table, complete with API No.3 bowl, Lifting sling, and bit breaker plate.	
2.6.2	One (1) API No. 1 insert bowl for 37.1/2" Rotary Table for use with 11.3/4" – 13.3/8" pipe or casing complete with lifting sling	
2.6.3	One (1) API No. 2 insert bowl for 37.1/2" Rotary Table for use with 9.5/8" – 10.3/4" pipe or casing complete with lifting sling	
2.6.4	One (1) 37.1/2" x 20" split casing bushing with lifting sling for 37.1/2" Rotary Table	
2.6.5	Bit breaker plates with bit breakers shall be provided for bits as specified at Section 3.1.10 (Reference to different bit sizes)	
2.7	WEAR GUIDE, MASTER BUSHING AND ADAPTER RING:	
2.7.1	Wear Guide Assembly to fit into Pin Drive Master Bushing and complete with "U" shaped Base Plate with split and hinged Wear Guide Ring. Assembly should protect the Master Bushing by limiting the movement of the Drill Pipe during drilling	
2.7.2	Adapter Ring should fit in the Master Bushing Wear Guide for use with drill pipes. The Adapter Rings to fit into the same Master Bushing Wear Guide Assembly. This is a component expected to wear in service.	

SECTION-3 : PIPE HANDLING SYSTEM		
3.1	IRON ROUGHNECK:	
	Iron Roughneck: Features & Specification	
3.1.1	Pedestal mounted iron Roughneck to handle joint connections of Drill string along with all the accessories	
3.1.2	Control of Iron roughneck should be provided in driller's cabin (Automatic) along with derrick floor (Manual)	
3.1.3	Automatic control of Iron Roughneck should be integrated with zone monitoring system of the Derrick floor	
3.1.4	Technical Specification:	
3.1.4.1	Tubular OD	3½ to 9. 3/4" (Fixture provision to handle 2-3/8" DP)
3.1.4.2	Torque Spin	3000 ft./lbs (minimum)
3.1.4.3	Spin Speed (on 5" DP)	90 RPM (Min.)
3.1.4.4	Makeup Torque	90,000ft-lbs (Min.)
3.1.4.5	Break out Torque	120,000ft-lbs (Min.)
3.1.4.6	Horizontal Adjustment	95" (Min.)
3.1.4.7	Vertical Adjustment	36" (Min.)
3.1.4.8	Connection Height	30" to 66"
3.1.5	Positioning Pre-set: Well centre, Mouse hole, Wait on tool joint and Parking	
3.1.6	Mud splashing containment system should be preferably Integral Part of Iron roughneck. Separate Mud splashing containment system is also acceptable.	
3.1.7	Tool joint finder to enable automatic pre-positioning of iron roughneck.	
3.1.8	Tightening torque should be measured and stored in the instrument system.	
3.1.9	The Hydraulic Requirement shall be met by Centralised Hydraulic Power Unit or HPU	
3.1.10	Hazardous Area Classification: Zone 1 (Complete Iron Roughneck)	
3.1.11	Following spares per rig to be supplied. Dies, any special grease & rollers. Note: Quantity as per Appendix-AA-VI	
3.2	CATWALK WITH RUNNERS (PIPE RACKS):	
	Catwalk: Features	

3.2.1	One (1) Catwalk (conventional type) suitable for Rig floor height (minimum 35 Ft)	
3.2.2	It should be capable of handling pipes (Drill pipes, Drill Collars, Casing and Tubing) of diameter 2 3/8" to 20" including 10" drill collars.	
3.2.3	Catwalk should be around 1066.8 mm (42 inch) high x 1524 mm (5 ft.) wide x 14.6 M (48 ft.) long catwalk, made in two sections (length wise). Top with 9.5 mm (3/8 inch) thick smooth MS plate with 19 mm (¾ inch) plate x 1524 mm (5 ft.) long on ramp end & catwalk end bumper stopper and complete with anchor post & lift eyes for each section.	
3.2.4	Runner (Pipe Rack): Features	
3.2.5	(i) Twelve (12) numbers of Pipe Runner/racks suitable for above catwalk for facilitating racking of tubulars/casing adjacent to the catwalk and aiding in the process of handling tubulars onto the catwalk from both sides. (ii) The pipe racks will be 42 inch in height x 28 ft in length with a base 42 inch in width. (ii) Top & bottom chords and all branches will be constructed of 4 inch, SCH-160 pipe. (iii) The racks will be built in a triangular configuration with pin sockets.	
3.2.6	The catwalk should be designed to facilitate ease of transportation so that the overall dimensions of individual components after disassembly for inter location rig movement are within the limit of overall dimensions for transportation as per clause 11.1-2 and 11.1-3 for items with and without skid respectively, irrespective of total length of the catwalk in assembled condition.	
3.3	HYDRAULIC POWER SLIP:	
3.3.1	The slip shall be used for casing, drill pipes, drill collars and tubing of different sizes with single body and suitable size slip inserts/bushings	
3.3.2	The product shall be conforming to API-7K and API monogrammed.	
3.3.3	Hydraulic Power requirement shall be met from the centralised Hydraulic Power Unit (HPU)	
3.3.4	Power slip shall be integrated with driller's control system (Driller's cabin)	
3.3.5	The slip shall be supplied with bushings/inserts for tubular range as mention below.	
3.3.6	Technical Specification:	
3.3.6.1	Rotary size	37-1/2"
3.3.6.2	Load Rating	500 Short Ton
3.3.6.3	Torque	45,000 ft. lbs
3.3.6.4	Range of tubular	
3.3.6.4.1	Drill pipe	2-3/8", 2-7/8", 3 ½", 5", 6-5/8"
3.3.6.4.2	Drill collar	4-3/4", 6 ¼", 6 ½", 8", 9 ½"
3.3.6.4.3	Casing	5", 5 ½", 7", 9-5/8", 13-3/8"
3.3.6.4.4	Tubing	2-3/8", 2 -7/8", 3-1/2"
3.4	HYDRAULIC CATHEAD: (2 Nos.)	
3.4.1	Preferably mounted on Derrick floor.	

3.4.2	Control of Hydraulic Cathead should be provided in driller's cabin.	
3.4.3	Technical Specification:	
3.4.3.1	Torque	150,000 ft-lbs minimum
3.4.3.2	Single Line Pull	32900 lbs minimum @ 2000PSI
3.4.3.3	Time period for power stroke	9 to 12 Seconds
3.4.3.4	Time period for return stroke	5 to 8 Seconds
3.4.3.5	Working Pressure	2500 psi minimum
3.4.3.6	Cylinder stroke length	22 to 38inch
3.4.3.7	Wire Rope Size	7/8" / Suitable size as per OEM's design.
3.4.4	Test pressure of the unit at the time of fabrication: 3000psi	
3.4.5	Pull indicator gauge: To read directly the line pull.	
3.4.6	Should be designed for supply of hydraulic power from common HPU	
3.4.7	Spring assembly as spare per cathead.	
	Note: Quantity as per Appendix-AA-VI	
3.5	CASING STABBING BOARD:	
	One (1) air powered (Hydraulic) heavy-duty counterbalanced Casing Stabbing Board with the following features:	
3.5.1	Frame should be heavy duty, fabricated from beams.	
3.5.2	Unit to permit travel from 7 M to 14.5 M (23 ft. to 47.57 ft.) above drill floor.	
3.5.3	Platform should be raised and lowered by hydraulic operated chain hoist / wire line. The chain / wire-line attaches to the platform at a spring-loaded safety latch, ensuring that the safety latch engages at any loss of tension in the chain.	
3.5.4	The hoist should be equipped with a positive engaging brake.	
3.5.5	The platform should include a foot-operated latch for fixing the platform at the desired elevation.	
3.5.6	The platform and handrails should fold against the tracks when the unit is out of service.	
3.5.7	Provision for centering of different sizes of casing during casing lowering (bidder to specify).	

	SECTION-4: MUD SYSTEM COMMON MANDATORY SPARES FOR FIVE RIGS: As per Appendix-AA-VI	
4.1	MUD PUMPS - 1600HP: Three (3) Nos. 1600 HP (1193 Kw) rated Input Horse Power Slush Pump of rating 7500 psi, Triplex Single Acting, Horizontal Piston Slush Pump/Mud Pump package with individual 2(two) piece "L" shaped(separate) interchangeable forged alloy steel Modules and replaceable cylinder Liners of various sizes to obtain desired discharge and pressure at rated SPM, having double relieved herringbone crankshaft and a pinion shaft gear. The pumps to be unitized with suitable VFD Motors, dual horizontally rear mounted, banded V-belt drive, with other standard accessories, mounted on an oil-field type minimum 3(three) runner skid, skidded on a master skid for on shore Drilling Rig. (The pump skid should be securely fastened on oil field type master skid)	
4.1.1	Type of Pump: Slush Pump, Triplex Single Acting, Horizontal Piston Pump of 7500 psi rating with individual 2(two) piece "L" shaped (separate) interchangeable forged alloy steel Modules and replaceable cylinder Liners of various sizes, any one in each category of Ranges 7"- 7½", 6"-6¾", 5¾"- 4½" etc. to obtain desired discharge and pressure at rated SPM, having double relieved herringbone crankshaft and a pinion shaft gear. The pump must be driven by dual end mounted suitable electric Motor with banded V-belt drive, complete with standard accessories mounted on an oil-field type minimum 3(three) runner skid, skidded on a master skid for on shore Drilling Rig. (The pump skid should be securely fastened on oil field type master skid).	
4.1.2	Mud Pump Capacity:	
4.1.2.1	Rated max. input HP	1600 HP (1193 kW) at rated SPM.
4.1.2.2	Stroke Length	11-inch (Min.)
4.1.2.3	Discharge (approx.)	Discharge at rated SPM with replaceable liners and pistons - Min. 2914 litres/min (770 US GPM) at 225 kg/cm ² (3200 PSI), and min. 1124 litres /min (297 US GPM) at 527.2 kg/cm ² (7500 PSI).
4.1.3	Pump Features:	
4.1.3.1	Fully enclosed fabricated steel plate (ASTM A-36 or equivalent) power end.	
4.1.3.2	Double relieved forged alloy steel Herringbone (double helix) type main gear.	
4.1.3.3	One piece Forged steel double extended pinion shaft with double helix gear	

4.1.3.4	One-piece forged steel crankshaft, with press fitted and keyed crank shaft lobes. Bearings of the pump must be of make Torrington / SKF / FAG/ NTN/ ARB/ Timken/ Schaeffler.
4.1.3.5	Provision for manual rotation of the crankshaft externally for maintenance purpose.
4.1.3.6	Modules should be individual, 2 (two) piece, 'L' shaped, separate, forged alloy steel (AISI 8630 / 4130 /equivalent), autofrettage, and completely interchangeable. Modules should be of 7500 psi rating with valve pots conforming to API Mod 7. Modules should be separate for both suction and discharge.
4.1.3.7	Fast change type screwed valve covers/Hydraulic valve cover system
4.1.3.8	Two-piece design fast change piston rods with clamp.
4.1.3.9	Three inlet suction manifold with suction stabilizer or suction dampener assembly and Discharge manifold with discharge pulsation dampener.
4.1.3.10	Piston-Liner Cooling/spray system that includes electric motors; suitable centrifugal pump for liner spray; cooling/ lubricant reservoir with suitable piping connection. The electric motors shall be of suitable capacity, 415V, 3 Ph., 50Hz and Ex. Certified for use in hazardous areas of drilling rigs. For details refer to section 9 (Electrical systems).
4.1.3.11	Pump fitted with liners (API 7K) held rigidly in place with a two-bolt retention clamp/adaptor nut/hydraulic liner retention system with accessories, premium pistons, valve seats (API 7K), centre guided valve with polyurethane insert.
4.1.3.12	Crankcase Lubrication system should be splash type and/ or forced lubrication.
4.1.3.13	Suction connection should be compatible with delivery connection of the supercharger pumps. Suitable isolation Butterfly valves to be fitted in intake line of each Supercharger Pump. A suitable Strainer (service/cleaning provision from top) to be connected in suction line of each Mud pump with Butterfly valve.
4.1.3.14	Discharge modules should be interconnected so as to make a smooth discharge flow through strainer cross; 5" API 7500psi, R.J. Flanged (screwed type) on one end and provide valve & bleed line connection on the other end.
4.1.3.15	Pump sheaves should be compatible for Gates 8-8VP-3150 heavy duty V-belt.
4.1.3.16	The pumps should be supplied complete with all the components of fluid end and power end (e.g. piston rods, pistons, liners, liner gaskets, liner bushings, wear plates, valve seats, valve assemblies, valve springs, seals & packings as per OEM manual, or any other item necessary) for commissioning and running the pumps at maximum discharge at rated SPM. The pumps should be mounted on a sufficiently strong skid (base skid) skidded on another oil field type skid (mother skid) having standard design for self-loading at both ends and base skid should be strongly anchored with the main pump skid (mother skid). The total length of skid should not be more than 7600mm. There should be proper lifting arrangement on the pump also.
4.1.3.17	Detailed technical specification and detailed technical drawing of the mud pump offered are to be submitted along with the technical offer. Detailed technical drawing of the base skid and mother skid are to be submitted along with the offer for our approval. Detailed GA drawing of the pump set along with dual rear mounted motors, pump drive and their accessories are to be submitted along with the offer.

4.1.3.18	The dimensions of the complete pump with mother skid should be within 7600 mm long x 2900 mm wide x 2500 mm height and the total package weight must not exceed 35000kg (Refer section 11.1 for details.). Justification is required if the above limiting dimensions cannot be met.
4.1.3.19	One complete valve seat puller assembly suitable for above mentioned valve seat and one set of special hand tools for fluid end maintenance (i.e. valve pot tool, wrench for valve cover, for studs on the hydraulic cylinders, strainer cross & discharge pulsation dampener etc) must be included with pump set to be supplied.
4.1.3.20	One no tool for manual rotation of the pump for maintenance.
4.1.3.21	2 No. additional belt for pump set to be supplied along with the pump. The belt make and size should be same as offered with the pump.
4.1.3.22	Suitable analogue type belt tension meter & belt alignment meter with complete operation & maintenance manual, 1 No.(set) with each pump to be supplied.
4.1.3.23	Suitable Stroke Counter Meter should be mounted on each pump locally.
4.1.3.24	A suitable fixture (s) to be provided (may be fitted on pump skid) for assembly/ disassembly of Piston assembly & Valve assembly.
4.1.3.25	Each mud pump package should be assembled with the following accessories:
4.1.3.26	One (1) Discharge Strainer Cross Assembly complete with suitable strainer (Left side when viewed from Fluid end). [Refer Fig (C), SECTION 4.7 of Technical Specifications)
4.1.3.27	5"-7500 psi (527.2 Kg/sq. cm) Max. WP Discharge flange RJ connection with weld neck (4.063"/104mm bore) welded to integral forced steel reducing elbow (MW.P. 7500 psi) of minimum 135 degrees. HP 4" delivery line from Discharge Flange to ground (by using elbow of minimum 135 degrees as mentioned above) to be connected to 3 ½" Vibrator hose (API 7K Grade E 7500 psi WP) which ultimately to be connected with ground junction manifold (using Wing union 4" FIG 1003, welded type) 4 inch (103 mm) x 7500 PSI (527 kg/sq.-cm) WP welded type gate valve connected to mud pump delivery with fig 1003 union.
4.1.3.28	5"-7500 psi (527.2 Kg/sq. cm) MWP flange RJ connection with 2-inch internal API LP thread for Pressure Gauge with 2" fig 1002 wing union and isolating valve (make OTECO/DEMCO) & one (1) extra 2" opening with high pressure plug to connect Drillo-meter
4.1.3.29	4"- 7500 Psi (527.2 Kg/sq. cm) MWP RJ Flange top connection with studs and nuts for Pulsation Dampener.
4.1.3.30	5" -7500 Psi (527.2 Kg/sq cm) MWP RJ Blind Flange End Connection for Strainer Clean-out with lifting eye (to be fitted perpendicular to centre line of the pump) for ease of servicing with a safety chain.
4.1.3.31	One (01) No. 3" Bleed line from HP TEE connection (at the end of the delivery manifold) to mud tank with 3" HP valve, suitable to handle 7500 PSI MWP. The bleed line should be connected to the 3" HP valve with 3" HP fig 1002 wing union having compatible line & fittings. Refer Fig (D) SECTION 4.7
4.1.3.32	One (01) No. 3" Bleed line from HP TEE connection (at the end of the delivery manifold) to ground with one (01) No. 3" HP valve suitable to handle 7500 PSI MWP having compatible HP lines & fittings

4.1.3.33	Three (03) Nos. Vibrator hose, API Grade-E, 3 1/2 inch ID with API LP Threads (external) both end, MWP 7500 psi as per API 7K for connecting Three (03) Nos. mud pumps to the ground junction manifold complete with Fig 1003 wing union on either ends
4.1.3.34	One (1) Discharge Pulsation Dampener (Make - Hydрил/Mattco or equivalent), maximum service pressure 7500 PSI (527.2 Kg/sq. cm), surge capacity 75 Litres (20 gallons). Connections - 4" (100 mm) API 7500 RTJ, Diaphragm – Hydrogenated Nitrile or equivalent.
4.1.3.35	One (1) Pressure gauge on each pump (Make- OTECO/CAMERON), 0 - 10000 PSI range with 2" (50 mm) line pipe female connection, and there should be provision to isolate the gauge with a 2" (50 mm) flex seal valve (Make- OTECO/DEMCO)
4.1.3.36	One (1) Manual reset relief valve, 3" (75 mm) manual reset 1500 – 7500 PSI WP (Make- OTECO/NOV).
4.1.3.37	Suitable external gear pump for circulating lube oil if any
	External closed circuit liner flushing mechanism
4.1.3.38	One (1) Charging hose assy. for pulsation dampener
4.1.3.39	One (1) Jib crane with trolley installed on each pump to handle fluid end parts
4.1.3.40	One (1) Yale hand hoist, 1/2 ton LH 8 Ft lift for use with Jib Crane
4.1.3.41	Emergency Stop Switch with locking & Indication system on Mud pump skid
4.1.3.42	Light fittings shall be Ex. Certified for use in hazardous areas of drilling rigs. Refer to section 9 (Electrical systems) for details of lighting specifications.
4.1.3.43	Space for installation of remote I/O Junction box. (I/O Box along with stand should be detachable from the main skid so that the same can be erected on ground to avoid loss of signal due to vibration). Incoming supply cable and all outgoing I/O signal cables should have plug socket connector provision at I/O JB. Special nut bolted protector for SPM sensor which is fitted with the pump, to avoid damage during repairing.
4.1.3.44	Double earthing system of main motors and all auxiliary motors with suitable size of GI strip earthing with MP skid. Refer to section 9 (Electrical systems) section for detailed earthing specifications.
4.1.4	Mud Pump Walkway
4.1.4.1	Working platforms around mud pump & approach walkway to Mud cleaner & Desander feed pump to be provided
4.1.4.2	Three nos. of Platforms of dimensions 2.9 X 2 X 1.5m (L X B X H) with grating top shall be placed in front of (Fluid end side)
4.1.4.3	Four Nos. of Platform of dimension 5 X 1 X 0.5m with chequered plate top to be kept on and between sides of Mud Pumps
4.1.4.4	One tool storage box of dimension 4 X 1 X 1m with four legs of 80cm to be provided with each rig.
4.2	PUMP DRIVE AND MOTOR SKID:
4.2.1	Dual rear mounted electric motor drive along the length of the pump for the offered Belt driven mud pump, including extended skid frame, motor supports, to be mounted on the master skid. Refer to section 9 (Electrical systems) for detailed motor specifications.

4.2.2	Pumps are to be fitted with suitable pulley (including hub) on both sides of pumps, and shall be connected with banded/ ribbed V belts and guard in case of belt drive.	
4.3	PUMP DRIVE MOTOR [For details, refer Section 9.1.4]	
4.4	BLOWER MOTOR ASSEMBLY :	
4.4.1	Mud Pump blower motor shall be of suitable capacity, 415V, 3 Ph., 50Hz and Ex. Certified for use in hazardous areas of drilling rigs. Ducting should be of steel sheet, with mesh filters. Refer to section 9 (Electrical systems) for detailed motor specifications.	
4.4.2	Terminal box – Blower Motor shall be fitted with double compression type FLP cable gland of suitable cable OD.	
4.5	MUD PUMP MANDATORY SPARES:	
	Mud Pump mandatory spares Per Rig (Consumables). The following mandatory spares shall be included in the scope of supply	
4.5.1	Liner (any one size) 7" /7¼"/7½"	Note: Quantity as per Appendix-AA-VI
4.5.2	Liner (any one size) 6"/6 ¼"/6½"	
4.5.3	Piston Assembly (any one size) 7" /7¼" /7½"	
4.5.4	Piston Assembly (any one size) 6"/6 ¼" /6½"	
4.5.5	Piston Rod complete	
4.5.6	DELETED	
4.5.7	DELETED	Note: Quantity as per Appendix-AA-VI
4.5.8	Valve Seat	
4.5.9	Valve assembly with polyurethane insert	
4.5.10	Valve insert (polyurethane)	
4.5.11	Valve spring	
4.5.12	Valve cover gasket	
4.5.13	Liner gasket, (any one size) 7"/7¼" /7½ "	
4.5.14	Liner gasket, (any one size) 6"/6 ¼" /6½"	
4.5.15	Wear plate gasket	
4.5.16	Wear plate	
4.5.17	DELETED	
4.5.18	Banded power belt left and right	

4.5.19	Pulsation Damper repair Kit	
4.5.20	Valve seat puller (with pump) set	
4.5.21	Lube Oil Pump Assembly	
4.5.22	Flushing Pump Assembly	
4.5.23	Lube oil Filters	
4.5.24	Ring Gasket for Suction, Discharge Manifold and Pulsation Dampener	
4.5.25	Stroke counter meter (To be confirmed by Cementing)	
4.5.26	Belt tension meter (analogue)	
4.5.27	3" RRV ,(1500 psi – 7500 psi), Manual reset	
4.5.28	Special Tools for fluid end & pulsation dampener maintenance	
4.5.29	DELETED	
4.5.30	Pulsation Dampener (rating 7500 psi) of Make- Mattco or equivalent suitable for the offered pumps	
4.5.31	Cross Piece (7500 psi rating)	
4.5.32	Infrared thermometer	
4.5.33	Piston Rubber (any one size) 7" /7¼" /7½"	
4.5.34	Piston Rubber (any one size) 6"/6 ¼ " /6½"	
4.5.35	Liner Bushing Puller and Wear Plate Puller (if applicable) Notes: Sizes of Liners and Pistons should be same	
4.5.36	Charging Hose assembly (with fittings) for Nitrogen pre-charging in Pulsation dampener	

4.5.37	Valve Cover	
4.5.38	0-10000 PSI Pr. gauge, type D, 2" Female	
4.5.39	3" gate valve, Max WP 7500 Psi,	
4.5.40	Repairing Kit, 3 gate valve, Max WP 7500 Psi	
4.5.41	10",8"& 6"etc Butterfly valve	
4.5.42	Vibrator hose, API Grade-E, 3.1/2 inch ID	
4.6	CHECK LIST FOR MUD PUMP : THE FOLLOWING CHECK LIST MUST BE COMPLETED AND RETURNED WITH THE OFFER. ALSO ENSURE THAT ALL THESE POINTS ARE COVERED IN YOUR OFFER. THESE WILL ENSURE THAT YOUR OFFER IS PROPERLY EVALUATED.	
4.6.1	Whether quoted as OEM of Pump and whether documentary evidences submitted to this effect?	
4.6.2	Whether quoted as Assembler?	
4.6.3	Whether quoted as Authorised Dealer of OEM (Pump), if so, has the dealer submitted documentary evidences in this regard?	
4.6.4	Whether the Pump offered is rated for continuous operation at full load?	
4.6.5	Whether the offered pump design is of two-piece Module?	
4.6.6	Whether the input HP of the Pump set 1600 HP to obtain the desired Hydraulics as per our NIT.	
4.6.7	Whether the pump offered having double helical (herringbone) main gear & pinion shaft with double helix gear?	
4.6.8	Whether the offered Mud pump sets are skidded on a master skid?	
4.6.9	Whether the Mud pump is equipped with belt driven system as asked for?	
4.6.10	Whether auxiliary motors are flame proof and suitable for use in hazardous area?	

4.6.11	Whether detail specifications of Pump along with technical literature / catalogue /schematic layout (plan & elevation) of the pump offered enclosed with the offer?
4.6.12	Whether spare parts for the offered pump will be available for next 15 years from now?
4.6.13	Whether 3 sets of part list with part numbers, quantity and unit rate recommended for four years of operation are submitted along with the bid?
4.6.14	Whether separately highlighted any deviation from the technical specification sought for?
4.6.15	Whether Test Certificates of Pump will be submitted along with the supply?
4.6.16	Whether Spares parts & Special tools for the pumps mentioned will be supplied?
4.7	HIGH PRESSURE MUD LINES & GROUND MANIFOLD SYSTEM FOR THREE PUMPS (Refer Fig- A, Section-4.7 of Technical Specifications) : Mandatory spares: As per Appendix-AA-VI
4.7.1.1	One (1) ground junction manifold consisting of seven (7) no. 4" mud gate valves of 7500 psi capacity for interchange ability of mud pump selection with suitable piping.
4.7.1.2	Ground junction manifold to have Fig 1003 at one end for connecting vibrator hose from mud pumps. 4" RTJ 7500 Max WP flange at the other end for connecting HP mud lines. All flanges shall be welded.
4.7.1.3	Manifold to be mounted on an oilfield type skid.
4.7.1.4	One (1) 2" mud gate valve 7500 PSI tapping to be provided for misc. jobs.
4.7.1.5	High Pressure Mud Lines
4.7.1.6	One (1) dual 4" (114.3 mm OD) XXS x 7500 PSI (527 kg/sq.-cm) WP high mud pressure delivery system for three mud pumps as follows:
4.7.1.7	4" XXS (Double Extra Strong) 7500 Psi Max WP, HP lines conforming to API 5L specifications complete with welded 7500 Psi Max WP, 4" RTJ Flanges (weld neck type as per API Spec 6BX) at break points upto the sub structure.
4.7.1.8	HP Bends & Wing Union at one terminal end to connect vibrator hose.
4.7.1.9	Two 3½" ID of length 3.0 m vibrator hoses of 7500 psi WP conforming to API Spec 7K Grade E for connecting to standpipe (below derrick floor) with 4" delivery line pipe. Hammer union (FIG 1003, misalign type) to be provided at both ends.
4.7.1.10	4" (114.3 mm OD) XXS HP line lines conforming to API 5L specifications for dual standpipe capable of withstanding 7500 psi upto H manifold.

4.7.1.11	Additional intermediate 7500 PSI (527 kg/sq.-cm) rated pipes conforming to API 5L specifications with RTJ flange (weld neck type) of suitable lengths to facilitate extension of both the delivery pipes to meet the min. 60m spacing between wells in cluster locations. The distance between two consecutive wells may be 15m approx. The maximum length of individual pipe should be limited to max. 9 mtr measured flange end to end. Note: The lengths of the pipes should match the spacing between the wells and may depend on the design of the substructure.
4.7.2	7500 PSI (527 kg/sq.-cm) WP DUAL STAND PIPE MANIFOLD. [Refer Fig (B), Section 4.7 of Technical Specifications]
4.7.2.1	Five (5) Nos. of 4" flanged gate valves Max WP 7500 Psi
4.7.2.2	Two (2) Single end 2" screwed end gate valves Max WP 7500 Psi
4.7.2.3	Two (2) 4" x 4" long sweep full flow TEE (Sch.160)
4.7.2.4	Four (4) 4", 7500 PSI (527 kg/sq-cm) WP misaligning union fig 1003 for standard service
4.7.2.5	Ten (10) RTJ weld neck flanges 4" 7500 PSI (527 kg/sq-cm) bored for 4" SCH. 160 pipe with ring gaskets.
4.7.2.6	Two (2) 4"x2" threads lets for pressure gauge and mud service connection with 2" screwed end gate valves Max WP 7500 Psi
4.7.2.7	One (1) Kill line kit consisting of a suitable length of XXS pipe, swivel joints & integral unions
4.7.2.8	One (1) 9.14 M (30 ft) long HP hose of 3000 Min WP with 2" Fig 1002 Integral union at each end for Hole Fill Line.
4.7.2.9	Two (2) 2" 7500 PSI (351 Kg/sq-cm/527 kg/sq-cm) Plugs
4.7.2.10	One (1) 0-10000 PSI gauge, 2" Female
4.7.2.11	Y connector change over adapter (2 female 1 male) to be supplied separator
4.7.2.12	Required pipe nipples, nuts and bolts
4.7.2.13	Forged reducing block Tee, 5" x 2" for cementing purpose

**DIAGRAMS OF MUD SYSTEM:
FIG A - HP GROUND MANIFOLD AND HP PIPING**

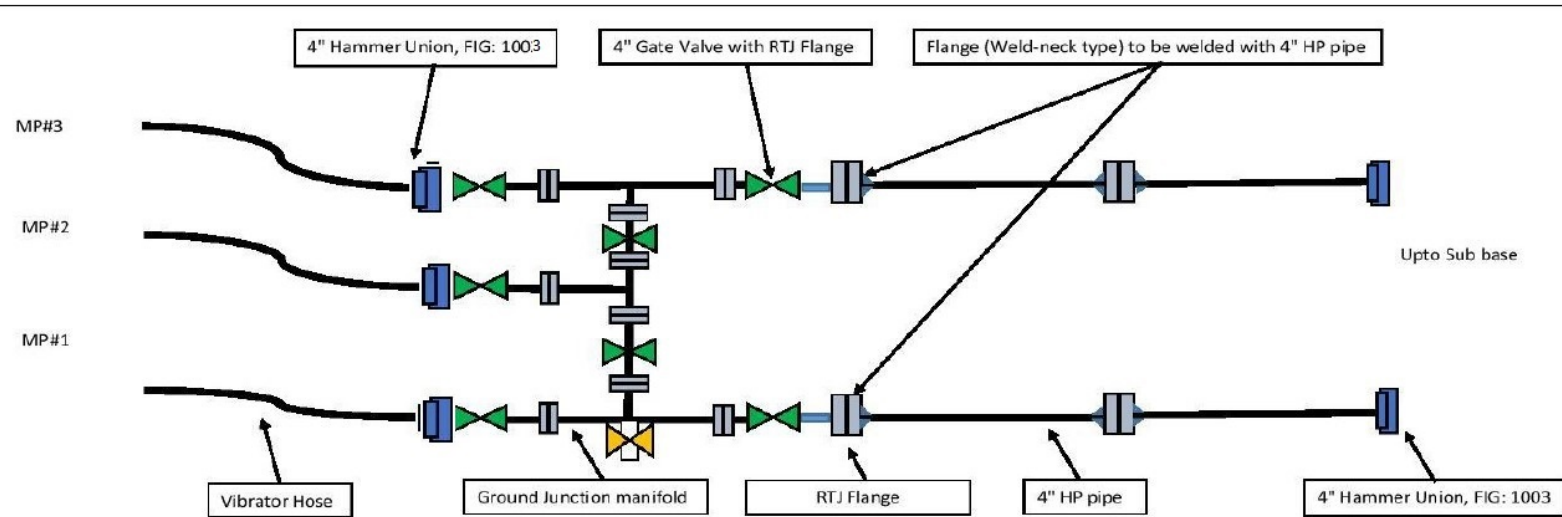


Fig (A): Schematic diagram of Pump Delivery Lines (Top view)

Nomenclature:

-  : Hose, Vibrator, API Grade E ; Size = 3 1/2" ID, W.P = 7500 PSI, API Std. 7
-  : 2" mud gate valve of 7500 PSI
-  : Hammer union, Fig 1003 Threaded, 4" XX HVY
-  : Gate Valve, Size- 4" with RTJ Flange, Pressure rating - 7500 PSI
-  : Flange Weld-neck type of Size - 4" with RTJ flange, Pressure rating - 7500 PSI
-  : High Pressure line pipe of Size - 4" & Pressure rating - 7500 PSI

FIG B: SCHEMATIC DIAGRAM OF JUNCTION MANIFOLD (VIEW FROM DRILLER CONSOLE):

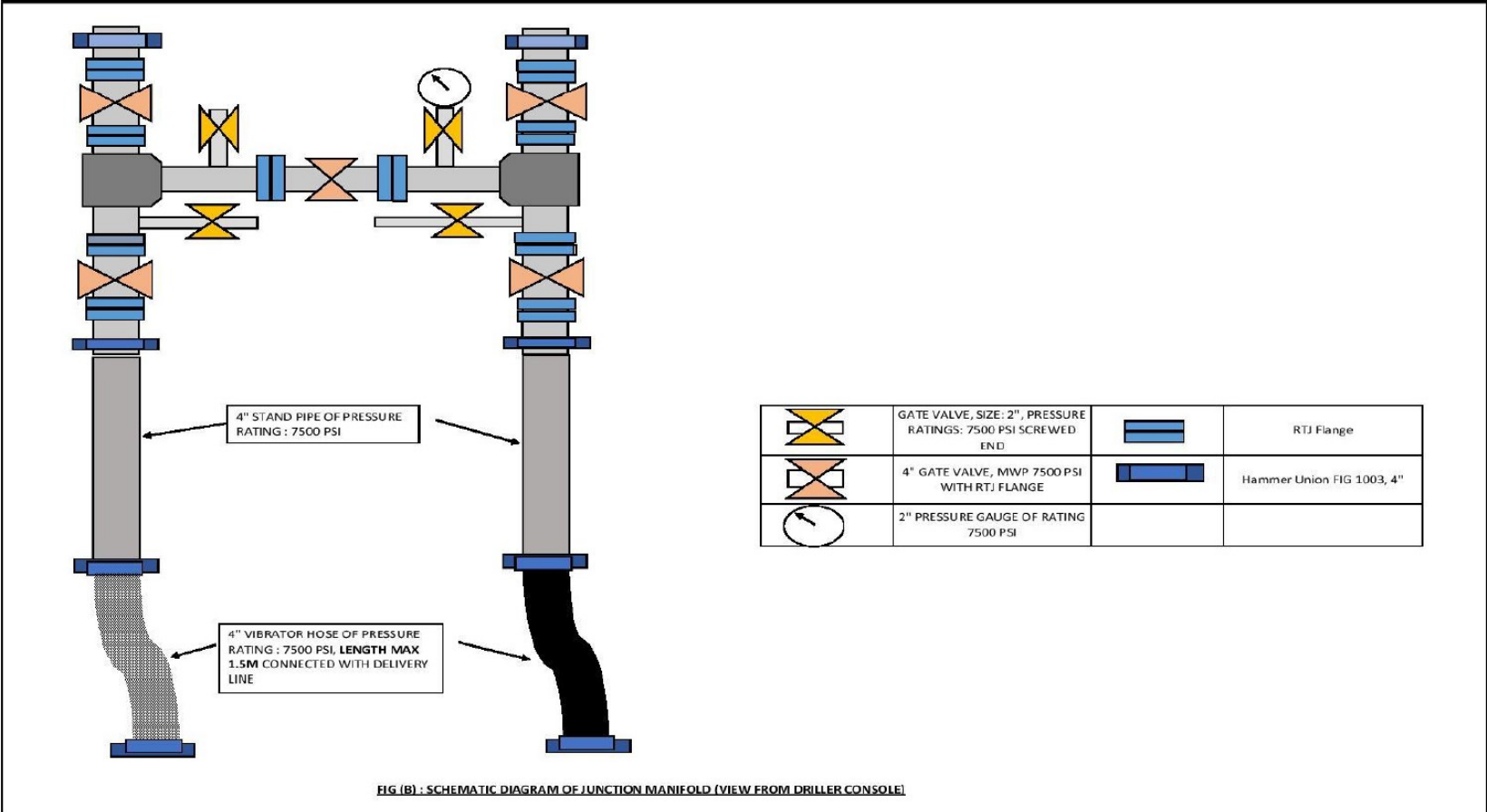


FIG C: MUD PUMP DELIVERY CONFIGURATION:

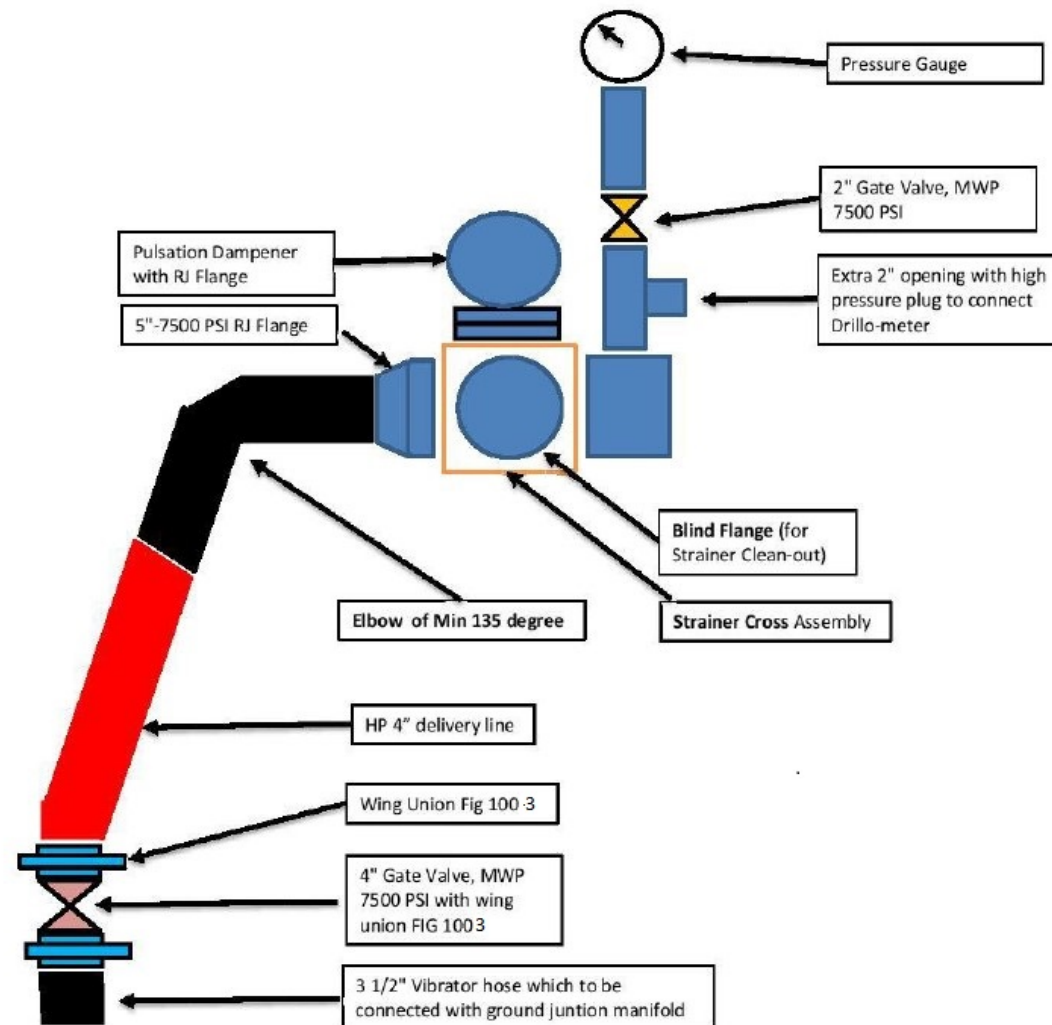
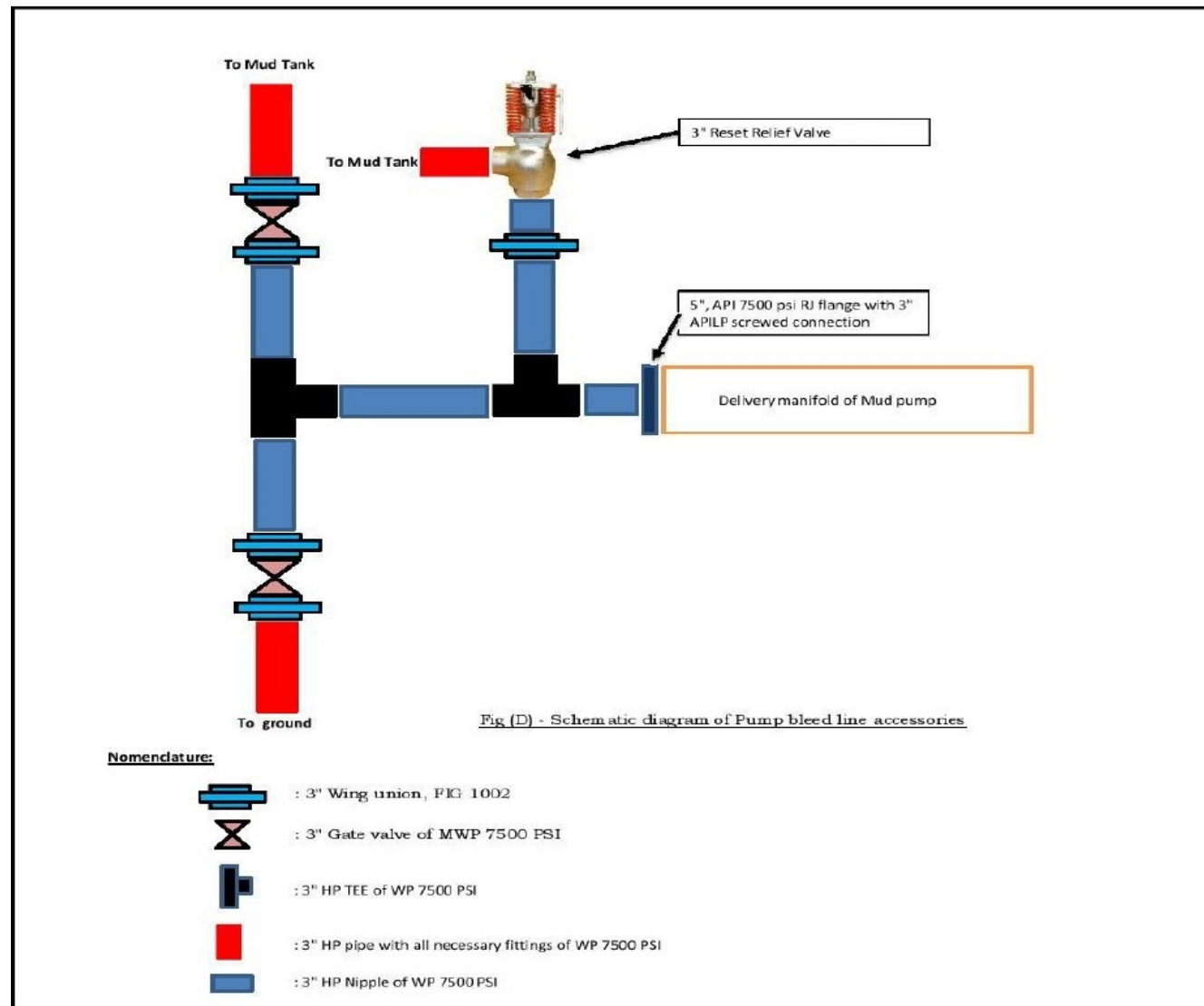


Fig (C) : Discharge Strainer Cross Assembly

FIG D: MUD PUMP BLEED LINE CONFIGURATION:



4.8	MUD SUPERCHARGING PUMP & SKID: Oil field type skid to accommodate the following: Mandatory spares: As per Appendix-AA-VI
4.8.1	Three (3) numbers centrifugal pumps of Make: National Oilwell Varco/ Adroit, India/ Gee Pumps PVT Ltd, India/ Harrisburg/ SPD Baker/ Mud Hog, (preferably Model: 8x6x14) having discharge of minimum 1200 US GPM each and minimum 30 mtr head. Pumps should be suitably positioned and mounted on a three-runner oilfield skid and floor with inter connections through piping, dresser type couplings and butterfly valves to super-charge the mud pumps suction. Gap between supercharger system and mud tank shall be approx. 900 mm to facilitate / ease of slinging of supercharger skid. Note: Pumps offered against clauses 4.8, 4.9 and 4.10 shall be of same make and model (preferably) for optimising spare holding.
4.8.2	Each of the three pumps shall be driven by suitably rated electric motor (415V, 3 Ph., 50Hz and Ex. Certified for use in hazardous areas of drilling rigs) with stainless steel rain protection canopy. Refer to section 9 (Electrical systems) for detailed motor specifications.
4.8.3	Suitably positioned and mounted on a three-runner oilfield skid and floor with inter connections through piping, dresser type couplings and butterfly valves
4.8.4	Suction manifold and discharge manifolds should be such that any 02 nos. of Mud Pumps can be charged by any 02 nos. of super charging pump. Suction points must be from suction tanks.
4.8.5	Each of the three pumps shall have stainless steel rain protection canopy.
4.8.6	Charge pump skid shall have provision for 4" water line directly from water tank at suction. Also one water manifold with min. 5 toppings of 1" shall be provided for misc. purpose.
4.8.7	All centrifugal pumps (mud supercharger pump) shall be of same make and model for all rigs.
4.8.8	Spares for four years normal operation of all centrifugal pumps (mud supercharger pump) should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4.
4.8.9	Technical specification sheet of the offered pumps and GA drawing of the Mud Supercharger Pumps and Skid shall be submitted along with the technical offer.
Note:	Dimension of the skid to be within the limiting dimension
4.9	MUD MIX PUMP ASSEMBLY Mandatory spares: As per Appendix-AA-VI

4.9.1	Two (2) centrifugal pumps of Make: National Oilwell Varco/ Adroit, India/Gee Pumps PVT Ltd, India/ Harrisburg/ SPD Baker/ Mud Hog, (preferably Model: 8x6x14), having minimum 1200 US GPM discharge each and minimum 30-meter head. The mud mix system shall be provided with 10" suction valve system with 8" suction header.
4.9.2	Sufficient space should be there for easy maintenance of pumps as well as motors.
4.9.3	Each mud mix shall be driven by Electric motor of minimum 75HP (415V, 3 Ph., 50Hz and Ex. Certified for use in hazardous areas of drilling rigs) with PBS near the motor. Refer to section 9 (Electrical systems) for detailed motor specifications. Motors should be equipped with stainless steel rain protection canopy.
4.9.4	Two (2) 6" Low pressure mud hopper with sack table and cutter
4.9.5	Two (2) 6" venturi tubes
4.9.6	Centrifugal pump suction and discharge manifolds
4.9.7	Two hopper discharge lines of 6" SCH 80 pipe with butterfly valves. It should have provision for discharge line to pill tank, suction tank, intermediate tank and all reserve tanks
4.9.8	Double Earthing. Refer to 9.8.1 of electrical section for detail earthing specification.
4.9.9	Separate Hopper suction line provision should be from pill tank, suction tank and all reserve tanks
4.9.10	One set Jet Shearing device should be integral part of system
4.9.11	Strainer to be provided in pump suction line
4.9.12	One water manifold with min. 5 tapings of 1" shall be provided for misc. purpose.
4.9.13	PBS for Mud Mixer to be provided on the tank at suitable location near the motor.
4.9.14	All centrifugal pumps (mud mix pump assembly) shall be of same make and model for all rigs.
4.9.15	Spares for four years normal operation of all centrifugal pumps (mud mix pump assembly) should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4
4.9.16	Technical specification sheet of the offered pump(s) shall be submitted along with the technical offer.
4.10	CENTRIFUGAL PUMPS FOR SOLID CONTROL: Mandatory spares: As per Appendix-AA-VI
4.10.1	Three (3) Nos. centrifugal pump Make: National Oilwell Varco/ Adroit, India/ Gee Pumps PVT Ltd, India/ Harrisburg/ SPD Baker/ Mud Hog (suction size: 8 inch minimum, delivery size: 6 inch minimum). The discharge and head of Desander & Desilter pump shall be 1.2 times (min.) of the operating volume and head of the offered ULMCM as per Clause 4.16.1.1

	The discharge and head of Degasser feed pump shall be 1.2 times (min.) of the operating volume and head of the offered Vacuum Type Degasser System as per Clause 4.17.1.1. The pumps should be suitably positioned and mounted on a three-runner oilfield skid and floor with inter connections through piping, dresser type couplings and butterfly valves to charge the De-sander, De-silter, degasser etc. Gap between pump system and mud tank shall be approx. 900 mm to facilitate / ease of slinging of common skid of solid control pumps. Strainer to be provided in pump suction line. Note: The make of the Desander, Desilter, Degasser feed pump shall be of same make .
4.10.2	Each pump shall be driven by suitably rated Electric motor (415V, 3 Ph., 50Hz and Ex. Certified for use in hazardous areas of drilling rigs) with PBS near the motor. Refer to section 9 (Electrical systems) detailed motor specification.
4.10.3	Suitably positioned and mounted on a three-runner oilfield skid and floor with inter connections through piping, dresser type couplings and butterfly valves
4.10.4	Each of the three pumps shall have stainless steel rain protection canopy.
4.10.5	One water manifold with min. 5 tapings of 1" shall be provided for misc. purpose.
4.10.6	PBS for ULMCM feed skid to be provided on the tank
4.10.7	All centrifugal pumps shall be of same make and model for all rigs.
4.10.8	Spares for four years normal operation of all centrifugal pumps should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4
4.10.9	Technical specification sheet of the offered pumps shall be submitted along with the technical offer. Bidder has to submit GA drawing of the lines, valves of the pumps and skid.
4.11	MULTISTAGE CENTRIFUGAL PUMPS & HOPPER SYSTEM (FOR GAUGING WATER): MANDATORY SPARES: As per Appendix-AA-VI
4.11.1	Two (2) electric motor of minimum 100 hp driven horizontal multistage centrifugal pumps i.e., Gauging water pump, Make: KIRLOSKAR, Model: FQA 6 or equivalent, set complete with piping/ Dresser type couplings and butterfly valves should be mounted on an independent three runner oilfield skid. The pumps shall be driven by suitably rated Electric motor of minimum (415V, 3 Ph., 50Hz and Ex. Certified for use in hazardous areas of drilling rigs) with PBS near the motor. Refer to section 9 (Electrical systems) for detailed motor specification.

4.11.2	These pump sets will be used to load chemicals through hoppers to water tanks, to gun the mixture and to feed chemical-mixed (Gauging) water in the cement hopper (on ground) for preparation of cement slurry.
4.11.3	02 (Two) Nos. hoppers to be supplied with all necessary piping and connected to the delivery of the multistage centrifugal pumps for chemical loading in the chemical tanks. The hoppers are to be positioned on the ground.
4.11.4	The centrifugal pumps should have cast steel body, bronze / cast iron impeller, EN 8 shaft with gland type packing and each should be capable of developing 175 m of head. The discharge of each pump should be minimum 60.0 m ³ / hr at 1450 rpm (approx.)
4.11.5	Individual strainer to be provide at the suction of each pump for fast cleaning
4.11.6	Suitably positioned near Water tanks and mounted on a three-runner oilfield skid and floor with inter connections through piping, dresser type couplings and butterfly valves
4.11.7	Each of the motors shall have stainless steel rain protection canopy.
4.11.8	All multistage centrifugal pumps shall be of same make and model for all rigs.
4.11.9	Spares for four years normal operation of all multistage centrifugal pumps should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4
4.11.10	Technical specification sheet of the offered pump shall be submitted along with the technical offer.
4.11.A	JET SHEAR DEVICE
4.11.A.1	One set Jet Shearing device having mud handling capacity of 300-500 GPM.
4.12	MUD AGITATORS: Mandatory spares: As per Appendix-AA-VI
4.12.1	Mud Agitators with turnaround time of 100 sec for 2.0 specific gravity, max. Viscosity 120 sec. water based mud (Load test performance certificate to be submitted)
4.12.2	All the agitators supplied shall be of same make and model
4.12.3	Mud Agitator: Features
	Stainless steel 304/ Carbon Steel impeller dynamically balanced impeller
	Motor and gear reducer Unitized on a suitable skid fabricated from structure of suitable size
	Motor and PBS: Agitators shall be shall be driven by suitably rated Electric motor (415V, 3 Ph, 50Hz and Ex. Certified for use in hazardous areas of drilling rigs) with PBS near the motor. Refer to section 9 (Electrical systems) for detailed motor specification.

4.12.4	Mud Agitator: Specification	
4.12.4.1	Liquid handled	Mud slurry
4.12.4.2	Specific gravity	1.0 to 2.0 SG
4.12.4.3	Viscosity	Max. 100 sec
4.12.4.4	Fluid temperature	up to 95°C
4.12.4.5	Direction of rotation	clockwise
4.12.4.6	Motor hp and speed	Suitable rating (of minimum 15HP) to meet requirement of Mud agitators
4.12.4.7	Shaft diameter	Min.3.5"/ As per OEM design subject to meeting the remaining technical specification
4.12.4.8	Blade type	Open Aerofoil / Canted /turbine type
4.12.4.9	Sweep diameter	Min 38 inch
4.12.4.10	Gear reducer type	Heli-Bevel /Worm gear, horizontal gear box.
4.12.4.11	Gear reducer speed	48 rpm to 90 rpm
4.12.4.12	Motor Gear Box Coupling	Flexible coupling
4.12.4.13	Spares for four years normal operation of all mud agitators should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4	
4.12.4.14	Technical specification sheet of the offered mud agitators shall be submitted along with the technical offer.	
4.13	MUD TANK SYSTEM	
	Mandatory spares: As per Appendix-AA-VI	
4.13.A	ROUNDED BOTTOM MUD TANK SYSTEM: Maximum acceptable dead volume: 1 m3	
4.13.A.1	Three (3) Active & Four (4) Reserve Mud Tanks: Seven (7) tanks. All mud tanks, including the shaker tank , should be of identical size (Mud cleaning equipment and Mud mixing equipment to be mounted on independent skids).	
4.13.A.2	Seven Mud Tank System along with Trip Tank, Pig House (with stand), mud cleaning equipment will be provided. Bidder to submit detailed Engineering drawing of the mud handling system including dimensions for approval. A separate drawing indicating the mud flow path shall also be provided.	
4.13.A.3	All centrifugal pumps (desander, desilter, degasser pump, supercharger pump, mud mixing pumps, trip tank pumps) and mud agitators shall be of same make and model for all the Rigs and suitable for handling drilling fluid of specific gravity up to 2.0 and viscosity up to 120.	
4.13.A.4	Mud Tank Capacity:	
4.13.A.4.1	One (1) Shaker tank	One (1) Shaker tank:

		Capacity of the shaker tank will be as per OEM design considering allowances for the specified three partitions and sloping bottom as per clause no.4.13.1.3, while maintaining the overall dimension identical with that of the other active and reserve tanks. (Bidder to confirm the shaker tank capacity in their technical bid).
4.13.A.4.2	One (1) Intermediate tank	Minimum 56 cum (Minimum 350 Barrels US)
4.13.A.4.3	One (1) Suction tank	Minimum 56 cum (Minimum 350 Barrels US)
4.13.A.4.4	Four (4) Reserve tanks	Minimum 56 cum (Minimum 350 Barrels US) each.
4.13.A.4.5	One (1) Trip Tank	16 cum (100 Barrel US)
4.13.A.5	Mud Tank: General Features	
4.13.A.5.1	Tank skid to be three runner oil Field type extended 1' at each end of tank for tail boarding. Tank bottom shall be of min 12mm thick and shell (side plates) & partitions to be of min 10 mm thick carbon steel (IS 2062) plates in all the tanks i.e. Mud tanks, treatment tank and Trip tank etc. Shell of the tank should be corrugated type.	
4.13.A.5.2	Each tank shall be provided with three clean out gates with 10 inch butterfly valves and with 6 inch long extension nipple. The gates shall be placed at the center in case of active and shaker tanks are placed on width side of reserve tanks.	
4.13.A.5.3	Each tank to have one 4" x 4" low-pressure Mud header and one 4" x 4" water header. Water header to have three 1" Welded thread outlets with plugs in each tank	
4.13.A.5.4	Side mounted walkways to be at same level of top of tank. Walkways fold to side of tank. All walkways covered with serrated non-corrosive bar grating.	
4.13.A.5.5	Top of the tanks covered with anti-corrosive grating.	
4.13.A.5.6	All the Tanks will be identical in size to accommodate the desired capacity. However, the capacity of the shaker tank will be as per OEM design.	
4.13.A.5.7	All the MUD tanks to be provided with suitable number (suction tank: 3 numbers, reserve: 2 nos. in each tank, intermediate: 2 no and shaker tank: 2 no) of mud agitators with Remote push button next to the motor. Refer to 9.1.6 & 9.1.7 of electrical section for detail motor specifications.	
4.13.A.5.8	Mud agitator along with Motor should be mounted on an elevated Skid on Mud Tank.	
4.13.A.5.9	Suitable arrangement (festoon / mechanized / any other cabling system suitable for use in Zone 2) for faster laying of cables shall be provided on Mud Tanks	
4.13.A.5.10	Mud tank Motors & PBS shall be Double-earthed as per IS-3043. Refer to section 9 (Electrical systems) for detailed earthing specification.	
4.13.A.5.11	Trip tank will have two pumps & motors with suitable line up. Motor shall be remote operated from Driller's cabin and Pig house.	
4.13.A.5.12	Valves and Couplings: Dresser type pipe couplings, butterfly valves should be provided. All internal piping to have vertical valve for inter-tank mud transfer (Drawing to be submitted)	
4.13.A.5.13	Mud Channels and gates: Mud channel with diversion gates should be provided in all the tanks as per the mud system requirement.	

4.13.A.5.14	Tank Volume Measuring Scale: All the tanks should be provided with permanently attached measuring scale made of anti-corrosive metal / alloy graduated in inch and foot to indicate volume per inch height. Additionally, Dip stick measuring scale (with inch gauging) made of anti-corrosive metal/alloy is to be provided for volume measurement.
4.13.A.5.15	All the tanks shall have Light pole having adequate individual LED lighting arrangement. The light poles should also be placed near mud nullah and shale shakers for proper illumination. These poles should be collapsible during transportation. All light fittings shall have Ex. Certification for use in hazardous areas of drilling rigs. Refer to section 9 (Electrical systems) for detailed lighting specification.
4.13.A.5.16	All clean out gates should have 10" butterfly valve gates.
4.13.A.5.17	Ladders inside and outside of the tanks should be provided in all mud tanks including pill tank and trip tank.
4.13.A.5.18	Overall height of the tank including the agitators should not exceed 3.2 m
4.13.A.5.19	All pumps should have a mechanical seal.
4.13.A.5.20	Provision for seal cooling (water), or as per PUMP OEM recommendations, should be provided with all the pumps
4.13.A.5.21	The mud tank should have discharge system in such a way that mud can be taken from any tank (Suction, intermediate and reserve tanks) with suitable manual vertical valves. (VENDOR to submit drawing for approval)
4.13.A.5.22	All internal tank pipings shall be of 10" dia and Schedule 80 with anti-corrosive polyurethane coating on outside surface.
4.13.A.5.23	Surface Preparation/ Sand Blasting/ Painting: All oil deposits should be removed by using approved de-greasing agents with special attention to drilled holes, bolt holes etc. The tanks shall be sand-blasted and painted with one coat of inorganic zinc primer 70 microns in thickness and two coats of Repack high build polyurethane.
4.13.A.5.24	Mud flow line of suitable size (12" dia.) with self-cleaning system to be provided for flow of mud from bell nipple to shale shaker through distribution lines.
4.13.A.5.25	Provision for discarding the mud from mud tanks drain lines to waste pit.
4.13.A.6	Electrical Earthing System: Each mud tank should have two nos. of GI strips 50mm X 6 mm mounted on the outside of the walls facing mud pumps and mud mix skid side. The strips 50mm X 6 mm should be welded to the sturdy supports which are welded to the tank wall. The gap between tank wall and strap: 50mm. Spacing between supports: 1000mm. The strap length should be the same as the tank length/ width. Gap between straps should be 150mm. From each strip there should be an earth connection to the Agitator motor body with 25mm x 3mm GI strip. (Two earth per Motor). All PBS should be earthed with GI wire of sufficient rating. Refer to 9.8.1 of electrical section for detail earthing specification.
4.13.A.7	V notch to be provided at the end of each tank for ease of placement and alignment of tank
4.13.1	SHAKER TANK: Features:
4.13.1.1	12" Flow Lines to connect mud distribution box to riser nipple.
4.13.1.2	Support beams for a) Two Mud agitators b) Three shale shaker with mud distribution box & c) Vacuum De-gasser.

	Shaker Tank should accommodate 3 nos. of Shale-shaker, Degasser & Mud agitator
4.13.1.3	Three Partition at shaker tank and sloping bottom for easy discharge of sand.
4.13.1.4	Mud ditch/Flow Line from Shaker with gates.
4.13.1.5	Suitable sand trap is to be provided.
4.13.1.6	One 10" Bottom adjustable equalizer connecting two compartments.
4.13.1.7	Three cleanout/Drain gates
4.13.1.8	3 X 3" Bottom Mud guns
4.13.1.9	One 12" coupling for ditch connection. One 10" connection for equalizer line. One 4" and one 4" connection for Mud and water service.
4.13.1.10	Non-Adjustable stair with handrails along towards trip tank.
4.13.1.11	SS Cladding of 6 mm thickness on outside towards waste pit side.
4.13.1.12	Shale Shaker effluent/ cutting trays [detachable] of length 3m -3.5m to be provided as per Shale Shaker positions. Three numbers of cutting boxes of capacity 4 cubic feet are to be supplied with each rig.
4.13.2	INTERMEDIATE TANK Features:
4.13.2.1	Support beams for Mud cleaner and vertical vacuum degasser.
4.13.2.2	Partition with top and bottom gate
4.13.2.3	Two Mud agitator support beams
4.13.2.4	Mud ditch with gates
4.13.2.5	Three cleanout gates
4.13.2.6	Two Nos. 3" LP bottom Mud guns
4.13.2.7	One 10" Mud suction valve.
4.13.2.8	Two 12" coupling for ditch connections. One 10" connection for equalizer line. One 10" coupling for pump suction.
4.13.2.9	One 4" coupling each for Mud and water service.
4.13.2.10	Discharge piping for both mud cleaner and degasser.
4.13.2.11	One non-adjustable stairway with handrails towards Mud Pumps.
4.13.2.13	SS Cladding of 6 mm thickness on outside towards waste pit side.
4.13.2.14	Effluent/ cutting tray [detachable] to be provided as per ULMMC position. Length of the cutting trays should be of the range 3-3.5m.
4.13.3	SUCTION TANK Features:
4.13.3.1	Two agitator support beams.
4.13.3.2	Pill tank with bottom gate capacity not less than 16 cum (100 barrel US). The pill tank should be fitted with 10 H.P. mud agitators.

4.13.3.3	Mud ditch with gates.
4.13.3.4	Three clean out gates.
4.13.3.5	3 X 3" Bottom Mud guns.
4.13.3.6	Three Nos. 10" connections for supercharger suction. Two Nos. 10" clean out valve. Two Nos. 10" connections for suction to mud loading pumps. Two No. 10" connections to 1st Reserve & intermediate tank. All connections in tanks to have suitable Butterfly Valve / flexible Dresser coupling as applicable. Internal / external piping with Dumb valve from Slug Pit to Supercharger shall be provided.
4.13.3.7	One 12" coupling for ditch connection. Three 10" coupling for centrifugal mud pump connection. Three 10" connections for pump suction lines, two 4" coupling (one each) for Mud and water service.
4.13.3.8	One non-adjustable stair with Handrails.
4.13.3.9	Extended two 6" Mud hoper lines for discharge into suction and reserve tank.
4.13.3.10	Extended one 6" Mud hoper lines for discharge into intermediate tank.
4.13.3.11	Provision shall be made for mud pump relief line with 3" hammer union -3 Nos.
4.13.4	RESERVE TANK Features:
4.13.4.1	Two agitator support beams in each tank.
4.13.4.2	Mud ditch with gates in each tank.
4.13.4.3	Three cleanout gates in each tank.
4.13.4.4	3 X 3" Bottom Mud guns.
4.13.4.5	Three 10" suction valves with piping in each tank.
4.13.4.6	For the 1st, 2nd & 3rd reserve tanks - Two Nos. 12" connections for mud ditch line & 4 Nos. 10" connections for interconnection between tanks. The last reserve tank to have only one 10" connection for mud ditch line and Two nos. connections for interconnection between tanks. Three Nos. clean out valves. All connections in tanks to have suitable Butterfly Valve / flexible Dresser coupling as applicable
4.13.4.7	Extended two 6" Mud mix hopper lines for discharge into tank (on each tank)
4.13.4.8	Each tank shall be partition in two parts with bottom equalizer
4.13.5	TRIP TANK: Trip tank with same width and height as that of mud tanks with capacity approximately 15 cubic meter mounted on three runner 17 feet long oil field skid and includes following: Mandatory spares: As per Appendix-AA-VI

	Features:
4.13.5.1	Tank covered with anti-corrosive bar grating.
4.13.5.2	Ladder inside and outside of the tank.
4.13.5.3	One clean out gate.
4.13.5.4	Two nos. 3"x2" Pumps driven by Electric motor of suitable capacity (415V, 3 Ph, 50Hz and Ex. Certified for use in hazardous areas of drilling rigs).
4.13.5.5	3" pump suction with two Butterfly valves.
4.13.5.6	2" Pump discharge with three Butterfly valves.
4.13.5.7	Fill line assembly include connection for Mud line on Shaker tank with valve, coupling & 4" pipe to trip tank.
4.13.5.8	2" 100R1 Hose from discharge of pumps to bell nipple of length 24m (2 x 12 meters each) shall be provided.
4.13.5.9	Agitator support beam with 10HP mud Agitator. Mud Agitators shall be driven by suitably rated Electric motor (415V, 3 Ph, 50Hz and Ex. Certified for use in hazardous areas of drilling rigs).
4.13.5.10	Direct mud level reading [sensitivity 1/2 bbl] and starting system of pump shall be made available in Driller's cabin as well as in/near the Pig house.
4.13.5.11	All centrifugal pumps (trip tank pump) shall be of same make and model for all rigs.
4.13.5.12	Spares for four years normal operation of all centrifugal pumps (trip tank pump) should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4
4.13.5.13	Technical specification sheet of the offered pump shall be submitted along with the technical offer.
4.13.6	CABIN FOR CHEMIST: (PIG HOUSE)
4.13.6.1	Cabin of 10' L x 6' W x 8' H mounted on a two-runner skid. Cabin bottom 6 mm thick. Sides, end and partitions to be of 3 mm thick carbon steel (IS 2062) plates. Cabin should include one sliding door, 4 Nos. of safety glass windows.
4.13.6.2	The cabin shall be placed near intermediate tank at the level of walkways.
4.13.6.3	Paneling on all the four sides and for ceiling (Glass wool insulation for ceiling). The cabin shall be provided with an L-shaped working table of width 2' at a height of 3' and a horizontal partition at 1 ½' height. All interior light fittings shall be Explosion proof type (suitable for use in hazardous areas of drilling rigs). The cabin shall be equipped with following minimum electrical items: a) LED Tube light fitting (Ex. Certified): 01 No. b) Emergency lamp (Ex. certified): 01 No. c) Wall/Stand mounted fan (Ex. Certified): 01 No. d) Receptacle with switch (Ex. Certified): 01 No. e) Exhaust fan with switch (Ex. Certified): 01 No. The lengthier side of working table is closed by sliding door.
4.13.6.4	One sink with provision for water connection is kept on the corner.
4.13.6.5	Safety glass windows in the cabin are provided with locking arrangement from inside.

4.13.6.6	The cabin shall have a cupboard and adequate provision for keeping mud testing equipment, tool box, oilfield mud balance such as Baroid and MF viscometer.	
4.14	MUD LOADING SYSTEM/ BARITES RAMP:	
4.14.1	One (1) Mud Loading System / Barites Ramp of 600 – 800 sq. ft. area and 4 ft. high for placement adjacent to the Active Mud System, with shade over the ramp for storing Bentonite, Barites and other bulk chemicals. Note: i) The height of the barite ramp shall be level with the top of the Mud Mixing hopper set-up for operational convenience. ii) Hand railings of adequate height to be provided around the barite ramp for operator's safety.	
4.15	Shale Shakers (3 Nos.)	
4.15.1	Three (3) nos. of Linear or Balanced Elliptical (minimum 7.3 G and capacity min 700 GPM with screen API 120 with 12 PPG polymer mud for one each basket) Shale Shaker. Specification of Shale Shaker and LMMC motors along with starter should be same.	
4.15.2	The LMSS shall have solids handling capacity of 50 Kg/min (equiv. 12.25" interval at 50 ft./hr) with 50% deck angle and API 120 with 12 PPG polymer mud. Shale Shaker shall be capable to work effectively while drilling intermediate hole sections (17 ½, 12 ¼ inch) at high angles / high discharges using advanced polymer /Synthetic Oil Base Mud systems requiring excellent solids control with fine screens which are able to separate / screen out solids down to 80 microns equivalent to API 200. Vendor to Specify screen life for above test condition.	
4.15.3	Shale Shakers: General Features	
4.15.3.1	One mud distribution box connecting all shaker units shall be provided.	
4.15.3.2	Each Shaker unit shall have single or double deck with minimum three pretension screens.	
4.15.3.3	Effluent/cutting tray of proper size (to cover across each shale shaker deck) up to 1.5m attach to the shale shaker tank and 3 to 3.5m long detachable tray shall be supplied along with shale shaker to discharge cuttings to waste pit.	
4.15.3.4	High pressure – low volume water jet cleaner with all accessories – Two (2) Nos. shall be provided with each Rig for cleaning the shale shaker screens.	
4.15.3.5	Mounting of Shale Shaker system should be within the shaker tank dimension.	
4.15.4	Functional Parameters	
	Parameters	Requirement
4.15.4.1	Type of Shale Shaker	Linear and/or Balanced Elliptical Motion.
4.15.4.2	Fluid handling Capacity	Mud, minimum 700 GPM, 12 ppg; at API-120. Solids handling capacity of 50 Kg/min (equiv. 12.25" interval at 50 ft./hr) with 50% deck angle. Performance curve on this requirement shall be submitted with the technical bid.
4.15.4.3	'G' force	G force transmitted to the screen should be minimum 7.3.

4.15.4.4	Vibrator Type	Minimum 2 Vibrating motors electrically driven for generating linear /balanced elliptical or dual motion.
4.15.4.5	Screen Decks	Single or Double Deck with minimum 3 Screen
4.15.4.6	Deck Angle	Variable type: minimum 6 Degree variation with adjustment system (mechanical)
4.15.4.7	Screen tensioning	Pre-tensioned Wire Cloth.
4.15.4.8	Screen type & construction	All screens must conform to API RP 13C standards for screen size and testing.
4.15.4.9	Net Screening Area	Each Shaker Unit must have a minimum 22.5 sq. ft. of net screening area as per API RP 13C Non-blanked Open Area specifications.
4.15.4.10	Specific gravity	Upto 2.0
4.15.4.11	Viscosity	Upto 120 sec per quart (946 ml)
4.15.5	Shale Shaker: Construction	
4.15.5.1	The screens must conform to API RP 13C standards for screen size and testing. Screens are to be pre-tensioned mounted on rigid frame.	
4.15.5.2	Motor: Shale shaker unit shall be driven by Electric Vibrator motors of suitable rating (415V, 3 Ph, 50Hz and Ex. Certified for use in hazardous areas of drilling rigs)along with Ex. Certified starter/PBS compatible with specified operating conditions & parameters for the intended service (HP & RPM). Refer to section 9 (Electrical systems) for detailed motor specification.	
4.15.5.3	The cable from Motor to DOL/Local control Panel should be of special quality (able to withstand high G vibrations and corrosive environment) and with additional supports to withstand continuous and rigorous vibrations.	
4.15.5.4	Starter: Starter panels shall be Explosion Proof type for use in hazardous areas of drilling rigs complete with Overload protection, shall be weatherproof type to avoid mud splashes. The starters are to be mounted on an independent metal frame. Earth leakage protection should be provided in the cubicle in MCC panel of Power Control Rooms. There shall be individual power supply system for individual basket (Shaker Unit) with separate control panels. The cable from Motor to Starter/Local control Panel should be of special quality and with additional supports to withstand continuous and rigorous vibrations.	
4.15.5.5	The material for Vibrating shaft, Vibrating basket, skid, Feeder, back tank and screen frame / backing plate will be constructed from carbon steel or superior. Screen bed shall be High Carbon Steel or better material. Clamping System: Suitable system for easy removal and fitting of screens.	

4.15.6	Following Screens to be supplied with each Rig:	
	Screen No. as per API RP 13C	Note: Quantity as per Appendix-AA-VI
4.15.6.1	API 20 / 25	
4.15.6.2	API 35 / 40	
4.15.6.3	API 50	
4.15.6.4	API 60/70	
4.15.6.5	API 80	
4.15.6.6	API100	
4.15.6.7	API 120	
4.15.6.8	Crown Rubber/Rubber Beddings	
4.15.6.9	Vibrator motor for each rig	
4.15.6.10	Vibrator motor bolts per rig	
4.15.6.11	Deck Spring per rig	
	1 Set= No. Of screen required in one LMSS	
4.16	UNITISED LINEAR MOTION MUD CLEANER (ULMMC)	
4.16.1	Unitised Linear Motion Mud Cleaner (ULMMC): Scope of Supply	
4.16.1.1	The unit shall include minimum 02 numbers 10” hydro-cyclones for Desander and minimum 20 numbers 4” hydro-cyclones for Desilter arranged in twin parallel rows of 10 cones each or in circular design. ULMMC shall be capable of handling min 1500 GPM of mud.	
4.16.1.2	Desilter under flow shall discharge on a fine mesh screen of linear motion vibrating shaker [Min. G Force-7.3] with fine mesh screen (API 270 - 325) that works on linear motion/ balanced elliptical principle. Higher sized screens are also acceptable.	
4.16.1.3	LMMC shall be incorporated with integral vibrator motor(s) for imparting energy to the shaker basket (to provide linear/ balanced elliptical motion)	
4.16.1.4	Motor and starter shall be of same specification as Shale Shaker. Motor foundation bolts shall be of such designed & made up of material to avoid shearing off/breakage during normal operations. The cable from Motor to DOL/Local control Panel should be of special quality and with additional supports to withstand continuous and rigorous vibrations.	
4.16.1.5	Mud through pressure gauge (feed gauge) to read feed pressure of various mud weights. Unit of measurement of pressure gauge must include “psi”. Feed and overflow headers. Victaulic clamps and couplings over flow header vent, Rubber bushing shall be included and mounted on the LMMC skid. The offered LMMC should be complete in all respect.	
4.16.1.6	Scope of supply also includes one set of screens API 170 fitted on each unit. One set of crown rubber discharge kit hand tool etc.	
4.16.2	Unitised Linear Motion Mud Cleaner (ULMMC): Technical Requirement	
4.16.2.1	Rated capacity of ULMMC should be 1500 GPM (min) and should be suitable for separating cutting from the mud of specific gravity up to 2.0 and viscosity up to 120 sec.	

4.16.2.2	Shaker of ULMMC should work on Linear Motion/ Balanced elliptical principle with adjustable Deck angle 0-5 degree (min) - Shaker of the ULMMC must be the same model as quoted in the LMSS section.	
4.16.2.3	ULMMC should be suitable for all types of mud including weighted or non-weighted oil based or water based and polymer mud.	
4.16.2.4	Micron cut of cones should be of 15-25 microns. Desilter hydro cyclone should be 4" size made of polyurethane material, ceramic insert moulded to withstand high abrasion, temperature and pressure. Cones should be light weighted and having high abrasion resistance. The discharge apex of the cone should be of easily removable type for clearing and replacement.	
4.16.2.5	Feed line should have such a design to provide adequate pressure to each cone. Unit of measurement of pressure gauge must include "psi".	
4.16.2.6	Desilter feed insert and overflow discharge headers should be as per OEM Design with 8-inch schedule 80 pipe. Header line should be provided with Victaulic Couplings on weld nipple.	
4.16.2.7	Mud Gravity gauge of suitable size and rating should be provided on inlet line of desilter.	
4.16.2.8	ULMMC should be suitable for continuous operations in oil field condition having operating fluid (MUD) temperature up to 95 °C	
4.16.2.9	ULMMC should efficiently operate with screen of API 120 to 400. Screen should be designed to provide highest throughput (conductance) and dryness of drilled particles with maximum screen life.	
4.16.2.10	Provision should be made for collection of discharge (coming out from hydro cyclone) either over linear motion shaker of LMMC or directly to discharge pit. Effluent/cutting tray to be provided from LMMC to waste pit	
4.16.3	Unitised Linear Motion Mud Cleaner (ULMMC): Construction	
4.16.3.1	The screens must conform to API RP 13C standards for screen size and testing. Screens are to be pre-tensioned mounted on rigid frame.	
4.16.3.2	Motor and starter shall be of same specification as Shale shaker.	
4.16.3.3	Provision of Earthing strip of suitable rating to be connected from starter panel to main earth strip on tank. Refer to 9.8.1 of electrical section for detail earthing specification.	
4.16.3.4	The material for Vibrating shaft, Vibrating basket, skid, Feeder, back tank and screen frame / backing plate will be constructed from carbon steel or superior. Screen bed shall be High Carbon Steel or better material. Clamping System: Polyurethane Wedge/ suitable system for easy removal and fitting of screens.	
4.16.4	Following Screens to be supplied with each Rig	
	Screen No. as per API RP 13C	Note: Quantity as per Appendix-AA-VI
4.16.4.1	API 170	
4.16.4.2	API 200/API 230	
4.16.4.3	API 270	
4.16.4.4	API 325	
4.16.4.5	Crown Rubber/ Rubber Bedding	
4.16.4.6	Desander Cones	
4.16.4.6.a	Desander Cones bend	

4.16.4.7	Desilter Cones	
4.16.4.7.a	Desilter Cones bend	
4.16.4.8	Vibrator motor for each rig	
4.16.4.9	Vibrator motor bolts per rig	
4.16.4.10	Deck Spring per rig	
	1 Set= No. Of screen required in one LMSS	
4.17	VACUUM TYPE DEGASSER: The vacuum type degasser unit (Degasser-Vertical Cylinder, Vacuum Pump, Prime mover & Skid) which is used: 1. To remove entrapped gas including H₂S and CO₂ from drilling fluid for trouble free operation. 2. Baffle plates shall be made of non-corrosive material. Mandatory spares: As per Appendix-AA-VI	
4.17.1	Vacuum Type Degasser: Functional Parameters	
4.17.1.1	The equipment shall be suitable for drilling fluid having specific gravity Upto 2. 0 and API funnel viscosity up to 120 seconds/quart. Mud handling capacity: 1200 GPM	
4.17.1.2	Drilling fluid operating temperature shall be up to 95°C and relative humidity up to 95%	
4.17.2	Vacuum Type Degasser: Vacuum Pump	
4.17.2.1	Positive displacement vacuum pump shall be stationary air cooled, continuous duty electrically belt driven.	
4.17.2.2	Maximum vacuum desired rating 203 to 381 mm (8" to 15") of mercury for maximum lift of 3 meters.	
4.17.2.3	Discharge gas output (maximum) of vacuum pump -1.6 m ³ /min (100 m ³ /h), 10m 80 Schedule MS pipe with stand hammer union connection.	
4.17.3	Vacuum Type Degasser: Prime Mover (Motor)	
4.17.3.1	Motor: Electric motors shall be of suitable rating (415V, 3 Ph, 50Hz and Ex. Certified for use in hazardous areas of drilling rigs). Provision of double earthing the motor shall be provided. Refer to section 9 (Electrical systems) for detailed motor specification.	
4.17.3.2	Cable terminal shall be through suitable size double compression type glands	
4.17.3.3	PBS/Starter Panels (Ex. Certified suitable for use in hazardous areas of Drilling rigs) shall be provided for the Motor for local operation.	
4.18	Centrifuge	
4.18.1	A High G-force capacity Centrifuge with long clarification area, capable to process high density mud at minimum 2000 G. Minimum bowl diameter of 14", Variable bowl speed of 3000 RPM or more, feed rate of about 240 GPM.	
4.18.2	The function of solids sedimentation, separation and draining are all to be combined in the centrifuge.	

4.18.3	The unit shall be complete with charging pump, driven by electric motor of suitable capacity (415V, 3 Ph, 50Hz and Ex. Certified for use in hazardous areas of drilling rigs) variable speed, hydraulic and torque control assembly.
4.18.4	The placement of the centrifuge should be at a high stand behind the intermediate tank and parallel to the pig house. The Underflow discharge of the centrifuge should be directed towards the retainer pit. The starter/Local control panel for centrifuge unit shall be placed near the motor and shall be Ex. Certified for use in hazardous areas of drilling rigs.
4.19	LIQUID DISPENSING UNIT FOR CHEMICAL
4.19.1	Automated electrically driven Liquid Dispensing Unit capable of transferring liquid chemical from barrel to dispensing point in measured/preset quantity
4.19.2	Unit shall be complete with piping, flow meter and connectors with capacity 20-25 l/min
4.20	CHEMICAL DOSING UNIT
4.20.1	Chemical Dosing unit for loading of Barite and other chemical sacks (max. weight 150KG/ Sack. Sack can be of any size 20 kg, 25 kg, 50 kg, 70 kg, 100 kg etc.) directly on to the hopper system/ Baryte silo
4.20.2	Unit shall be integrated with Mud Hopping/Mixing system.
4.21	SKID MOUNTED MUD GAS SEPARATOR (ONE UNIT PER RIG)
4.21.1	General Features and specifications: Each Skid mounted Mud Gas Separator (Poor Boy Degasser) for Land Drilling Rig shall have the following features & specifications: 1. Closed Bottom, atmospheric pressure type. 2. Fluid Handling Capacity: 1000 GPM 3. Body Diameter maximum: 47.1/4 inch (1200 mm) 4. Skid Height: 86.1/2 inch (2200 mm) 5. Maximum Weight: 15000 lbs (6800 Kg) 6. Flanged Gooseneck Fluid Outlet to maintain Fluid Seal minimum height of 51.1/8 inch (1300 mm). 7. Drilling Fluid Outlet Diameter: 8 inch (203.20 mm) 8. Drilling Fluid Inlet Diameter: 6 inch (152.40 mm) 9. Gas Outlet Diameter: 8 inch (203.20 mm)

10. Distance from Centreline of Drilling Fluid Inlet and contoured top centre: minimum 47.1/4 inch (1200 mm).
11. Sump zone Height: maximum 11.7/8 inch (300 mm).
12. Target Plate/ Impingement plate against the Drilling Fluid Inlet point for splashing.
13. Sufficient nos. of semi-circular baffles for efficient separation of Gas from Drilling Fluid.
14. Provision for draining sump volume with valves and cleaning at the bottom.
15. Observation port at the top section.
16. 8 inch (203.20 mm) OD Gas vent line with 15 mtr extension from the unit and necessary fittings.
17. 6 inch (152.40 mm) Drilling Fluid Inlet line with end fittings.
18. The vessel is designed in accordance with ASME and NACE specifications.
19. The vessel is coated inside and out with corrosion resistant epoxy paint.
20. An allowance of 1/8 inch (3 mm) for corrosion to be considered for the vessel.
21. Materials of construction: IS/ASTM/ASA.
22. Vessel is to be pressure tested for working pressure of 30 psi (2.11 Kg/ sq. cm).
23. The unit should be suitable for transportation in lying down condition.
24. The Skid should be suitable to bear the load in full capacity.
25. Suitable Lifting arrangement for transportation should be provided.
26. Proper walkway with railings around the vessel should be provided along with the ladder.
27. A pressure gauge 0-300 psi should be fitted at suitable location.

	Each unit shall be supplied with the following accessories: i) Studs & nuts for all the flanged connection. ii) Three (3) nos. of Operation and Maintenance Manual. iii) Warranty/Guarantee certificate.																		
4.21.2	Accessories: The following accessories to be provided with each unit: <table><tr><td>Sl. No.</td><td>Components</td><td>Qty.</td></tr><tr><td>1</td><td>Hammer union 6 “</td><td>Two sets</td></tr><tr><td>2</td><td>Hammer union 8 “</td><td>Two sets</td></tr><tr><td>3</td><td>Gasket of suitable sizes</td><td>Two sets each</td></tr><tr><td>4</td><td>Nuts, bolts and washers</td><td>Two sets</td></tr><tr><td>5</td><td>Pressure gauge (0-300psi)</td><td>Two sets</td></tr></table>	Sl. No.	Components	Qty.	1	Hammer union 6 “	Two sets	2	Hammer union 8 “	Two sets	3	Gasket of suitable sizes	Two sets each	4	Nuts, bolts and washers	Two sets	5	Pressure gauge (0-300psi)	Two sets
Sl. No.	Components	Qty.																	
1	Hammer union 6 “	Two sets																	
2	Hammer union 8 “	Two sets																	
3	Gasket of suitable sizes	Two sets each																	
4	Nuts, bolts and washers	Two sets																	
5	Pressure gauge (0-300psi)	Two sets																	
4.21.3	Spare parts & Tools: Bidder to include spares for four years of normal operation of all equipment / system in the offer indicating item, part no. & quantity required.																		
4.21.4	Name Plate Details: A name plate securely fastened to the equipment, with following/ relevant information (engraved/embossed) shall be provided as per standard manufacturer practice, on the body of the MGS Unit. Manufacturer's name/logo Model/type Serial Number Year of manufacture Working Pressure																		
4.21.5	Miscellaneous: Bidder to provide technical literature along with drawing showing internal piping/construction.																		

SECTION-5: POWER SYSTEM		
5.1	POWER PACK	
	Mandatory spares: As per Appendix-AA-VI	
5.1.1	TECHNICAL SPECIFICATIONS FOR POWER PACKS:	
5.1.1.1	No. of power packs per rig	Min Five (05) Nos. of CAT 3512B- 1000 RPM Engines out of which Two (02) Nos. CAT 3512B – 1000 RPM Engines will be supplied by OIL INDIA for Retrofitting (Refer Section 5.1.A). The rig shall be powered by min Five (05) No. of engines. However, the bidder may calculate power requirement of the Rig and propose higher No. of new engines.
5.1.1.2	Rating Prime power (Engine)	at least 1200 BHP at 1000 rpm and should match alternator capacity
5.1.1.3	Fuel Type	Diesel
5.1.1.4	Fuel System	Complete with Fuel filter, fuel transfer pump, fuel priming pump, electronically controlled injectors. Individual water separator to be provided for each engine. Note : The bidder should offer Engine compliant to BS VI diesel fuel standard
5.1.1.5	Type of cooling	Water - Radiator cooled with fan
5.1.1.6	Starting	Air starter
5.1.1.7	Charging system	Charging Alternator driven by engine
5.1.1.8	Air Inlet system	After cooled turbo charged with heavy duty filter.
5.1.1.9	Exhaust System	Flexible Cone expander, Elbow, PESO approved Spark arrestor, Muffler, outlet pipe, extended stack height as per CPCB (India) norm.
5.1.1.10	Flywheel & Flywheel Housing	Mounted with MPU compatible with controls. No. of teeth should be 183 for magnetic pick up, 3050 Hz at 1000 rpm. Magnetic pick-up should be mounted on the flywheel housing for speed feedback to AC Control Module with MPU compatible with controls. The resistance should be 150 Ohms. The pitch of the Flywheel teeth should be compatible with MPU tip.
5.1.1.11	Engine Rotation	Standard (Counter-Clockwise as viewed from Flywheel end)
5.1.1.12	Instrumentation	Electronic panel shall display: ECM voltage Engine oil pressure

		Engine water temperature. Fuel pressure System DC voltage Air inlet restriction LH & RH Exhaust temperature (prior to turbochargers) Fuel filter differential pressure Oil filter differential pressure Tachometer Engine Running Hours Instantaneous fuel consumption Total fuel consumed Engine control switch (4 position) Alarms Over speed shut down notification light Hooter Pre-lube override Shut down override
5.1.1.13	Safety protection	Low lube oil pressure, Engine Over speed, water/coolant high temperature & Low coolant level, air inlet shut off. Local emergency stop switch with locking system/protected must be on the outside wall of acoustic enclosure.
5.1.1.14	Control System	Suitable Advanced Diesel Engine Management, ECM with electronically controlled unit injectors, controlled by electronic /PLC 24V DC Battery along with individual charging system. Control panel in the VFD PCR should be capable of governing the engine by a DC input to engine ranging 0-200 milliamp for the entire loading range.
5.1.1.15	Emission Norms	The engine shall conform to the latest emission standard as applicable in India for On-shore Rig Power application at the time of delivery as per latest CPCB norms. For Diesel Engines > 800KW applicable emission norms have been published in Govt. of India Gazette Notification G.S.R. 489(E), engine offered by the bidder to comply to the emission norms as laid down in the above-mentioned notification.
5.1.1.16	Engine Control	Integrated Control for Engine, Alternator

5.1.2	ALTERNATOR: Refer to Section 9 (Electrical Systems)
5.1.3	ACOUSTIC ENCLOSURE:
5.1.3.1	Each powerpack shall have individual acoustic enclosure (Individual Cap on type, Modular Acoustic Enclosure). The acoustic enclosure shall be designed for minimum 25 db (A) insertion loss for meeting the ambient noise standards, whichever is on the higher side. Details available in The Environment (Protection) Rules 1986, Serial No. 94. MoEF Notification dated 19th Nov. 1986
5.1.3.2	The DG set shall be provided with proper exhaust muffler (stack height as per CPCB guideline) with insertion loss of minimum 25 db(A) Authorised agencies for certification as per CPCB- 1. Automotive Research Association of India, Pune 2. National Physical Laboratory, New Delhi 3. Naval Science & Technology Laboratory, Visakhapatnam 4. Fluid Control Research Institute, Palghat. 5. National Aerospace Laboratory, Bangalore
5.1.4	Operating Site Condition : The engines should be suitable for operation in ambient temperature: +4°C to 47°C & RH up to 95% Engine ambient temperature: 45° Cent. (Max) Engine site temperature: 5° Cent. (Min) Maximum relative humidity at 35°C: 95% Maximum Altitude above sea level: 150m. Average annual rainfall: 343 cms. The engine shall conform to specifications IS 10002 /BS 5514 or equivalent, Prime Power rating, operating cycle 24 Hr. with an overload capacity of 10% for a period not exceeding one hour in any 12 hours running. The engine may be provided with jacket water heater if recommended by OEM.
5.1.5	GENERAL FEATURE FOR ENGINE CANOPY :
5.1.5.1	The acoustic enclosure shall have sufficient space for easy maintenance of the Engine and alternators. Should have louvres for sufficient flow of air. LED lights with sufficient illumination all around the engine – Refer 9.4.3
5.1.5.2	Space between two engines shall be covered by platforms or collapsible tray
5.1.5.3	The enclosure walls shall be powder coated of recommended colour by OEM
5.1.5.4	Stack and Silencer shall be positioned and secured properly for easy fitment after every Rig movement
5.1.5.5	Small chain pulley system shall be provided for lifting small sub-assemblies properly during maintenance
5.1.5.6	Doors of canopy should be wide enough to provide ease of maintenance. The doors shall have SS door handles and latches

5.1.5.7	Provide suitable steps to access into power pack from outside	
5.1.5.8	Temperature Difference 5-7 ° C	
5.1.6	ONLINE MONITORING SYSTEM:	
5.1.6.1	Online Monitoring system: Suitable online monitoring system recommended by CATERPILLAR for all the engines (including the ones supplied by OIL for retrofitting) capable to communicate engine data remotely to monitoring station through internet / telecommunication network.	
5.1.6.2	System shall continuously display vital engine parameters, alarms and display error codes.	
5.1.6.3	The bidder shall provide proprietary licenses for the online monitoring system, enabling monitoring all engines including the ones retrofitted.	
5.1.6.4	The bidder shall provide operational & maintenance support services for the online monitoring system including subscription (if any) during the 1-year warranty period from the date of commissioning of the rigs. No separate charges are payable by OIL for the above.	
5.1.7	COMPONENTS TO BE OFFERED WITH FOUR POWER PACK:	
5.1.7.1	One (1) sets of standard tool kit for carrying out maintenance up to top overhaul of engine should be supplied in a conventional tool box with each rig. Bidder to submit the list of tools. Refer Sec. 5.1.9	
5.1.7.2	In addition to above, the special tools & provisions as mentioned below should be supplied along with each Rig as per OEM's list and OEM's tool list must be submitted by all the bidders along with bid document.	
5.1.7.3	Alternator Alignment Tool kit with Instruction Manual in soft and hard format	2 Nos.
5.1.7.4	Valve Tappet Setting Tool kit	1 No.
5.1.7.5	Pneumatic wrench	1 No.
5.1.7.6	Caterpillar cranking tool	1 No. (if recommended by OEM)
5.1.7.7	Hydraulic jack for alternator alignment	1 No.
5.1.7.8	Fuel Injector Timing setting tool	1 No. (if recommended by OEM)
5.1.7.9	Air Restriction Measurement tool	1 No. (if recommended by OEM)
5.1.7.10	Heavy Duty Digital Multimeter	1 No. (Refer Section 9.10.4.10)
5.1.7.11	Infra-Red Digital Thermometer	1 No. (Refer Section 9.10.4.10)

5.1.7.12	Infra-Red Digital Tachometer (0 to 9999 RPM)	1 No. (Refer Section 9.10.4.11)
5.1.7.13	ET tool with Laptop having 1-year license with renewable subscription for monitoring Engine Parameters. OIL would pay annual subscription (if any) after one year. Engine Fault Diagnostic Tools (both software as well as hardware) shall be supplied along with the unit. Bidder shall categorically confirm in the bid that the offered software is for the particular engine.	02 Nos.
5.1.7.14	Engine OEM's recommended /Reputed make battery Charger or Charging Alternator & 24 V Battery for ECM for each unit	1 Set/PP
5.1.7.15	Single phase 3pin 6A power receptacle in each power pack near Alternator (For Laptop).	01/ PP
5.1.7.16	LED lights & Light Fitting for proper illumination	04/PP
5.1.7.17	Double earthing with GI strip of suitable dimension	01/PP
	NB: PP indicates Power Pack. Bidder to confirm supply of the tool kit as above and special tools in the technical bid. Prices of such tools must be included in the cost of total rig package.	
5.1.8	Technical Check list for Caterpillar Engine	
5.1.8.1	Whether the offered engine is four stroke ,12-cylinder diesel engine having direct injection, turbocharged, after cooled and counter clock-wise rotation (as viewed from flywheel end)?	YES/NO

5.1.8.2	Whether the offered engine is capable of developing gross horse power 1250 at 1000 RPM to drive the Alternator supplied?	YES/ NO
5.1.8.3	Whether the offered engine is compatible to power and torque trend (varying loading pattern), responsive to instantaneous load and torque changes?	YES/ NO
5.1.8.4	Whether the rating of the offered engine is Prime Power?	YES/ NO
5.1.8.5	Whether the offered engine is compatible Variable Frequency Drive (VFD) and suitable for drilling rig application?	YES/ NO
5.1.8.6	Whether detail specifications of engine and alternator along with technical literature / catalogue /schematic layout (plan & elevation) of the engine and alternator offered enclosed with the offer?	YES/NO
5.1.8.7	Whether the rated RPM of the offered engine is 1000?	YES/ NO
5.1.8.8	Has the bidder clearly mentioned the specification of the cooling system of the offered engine? Whether the bidder provided the heat load calculations for offering Radiator along with the offer for OIL's scrutiny. ?	YES/ NO
5.1.8.9	Has the bidder clearly mentioned the specification of all the general accessories /fittings of the offered engine?	YES/ NO
5.1.8.10	Has the bidder provided the general arrangement / dimensional drawing of the offered engine and alternator?	YES/ NO
5.1.8.11	Whether the bidder gives assurance that after sales service in respect of engine and alternator will be	YES/ NO

	provided by their respective OEMs or authorized dealer for 10 years?	
5.1.8.12	Whether the bidder gives the confirmation from the OEMs that the equipment to be supplied are not going to be obsolete for next 10 years and provision for supplying spares of the equipment to be continued?	YES/ NO
5.1.8.13	Whether the bidder will install and commission the power packs at site in and around Duliajan, Assam, India. ?	YES/NO
5.1.8.14	Do you agree to the conditions that power packs will be inspected in stages by OIL's representatives before dispatch and load testing of the same shall be carried out in presence of OIL's representative at manufacturer's works?	YES/ NO
5.1.8.15	Has the bidder separately highlighted any deviation from the technical specifications?	YES/ NO
5.1.8.16	Whether the Emission norms of the Supplied Engines are as per latest CPCB norms in India?	YES/ NO
5.1.8.17	Has the bidder mentioned any other items/ points not indicated/ included in the specifications, but deemed necessary for installation/ commissioning and efficient control, operation and protection of the alternators and engines?	YES/ NO
5.1.8.18	Whether the bidder will supply the Special Tools as mentioned?	YES/ NO
5.1.8.19	Whether noise level produced by the engine with acoustic enclosure is as per latest CPCB norms (ensure 25 dBA insertion loss)?	YES/ NO
5.1.8.20	Whether Stack height of Exhaust of the Engine is as per latest CPCB norms. Bidder to provide the stack height calculation as per CPCB.	YES/ NO

5.1.8.21	Whether the bidder will supply the Tool kit as per Annexure I as mentioned?	YES/ NO
5.1.8.22	Whether the bidder has agreed to unitize commission and integrate the existing CAT 3512 Engines of OIL with new alternator and VFD PCR included in the scope of supply & work in OIL's operational areas. Refer SECTION 5.1 A: RETROFITTING OF CAT 3512B ENGINES	YES/ NO
5.1.9	ANNEXURE I: STANDARD TOOL KIT FOR CAT ENGINES	
1	One (1) each of OPEN JAW DOUBLE ENDED SPANER, SIZES (in MM): 6 x 7, 8 x 9, 10 x 11, 12 x 13, 14 x 15, 16 x 17, 18 x 19, 20 x 22, 21 x 23, 24 x 26, 25 x 27, 28 x 30, 30 x 32 (TOTAL 13 NOS.) MAKE: GRIPHOLD / MEKASTER / STANLEY	
2	One (1) each of DOUBLE ENDED RING SPANNER, SIZES (in MM): 6 x 7, 8 x 9, 10 x 11, 12 x 13, 14 x 15, 16 x 17, 18 x 19, 20 x 22, 21 x 23, 24 x 26, 25 x 27, 28 x 30, 30 x 32 (TOTAL 13 NOS.) MAKE: GRIPHOLD / MEKASTER / STANLEY	
3	One (1) each of HEAVY DUTY DOUBLE HEX. STD. SOCKETS IN 1/2" SQ. DRIVE, ISIZES (in MM): 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32 & 34 (TOTAL 26 NOS.) MAKE: GRIPHOLD / MEKASTER / STANLEY	
4	One (1) REVERSIBLE RATCHET IN 1/2" SQ. DRIVE, OVERALL LENGTH: 260 MM. MAKE: GRIPHOLD / MEKASTER / STANLEY	
5	One (1) SLIDING T-HANDLE IN 1/2" SQ. DRIVE, OVERALL LENGTH: 300 MM. MAKE: GRIPHOLD / MEKASTER / STANLEY	
6	One (1)each of EXTENSION BAR IN 1/2" SQ. DRIVE, with OVERALL LENGTH 75 MM, 125 MM & 300 MM respectively. MAKE: GRIPHOLD / MEKASTER / STANLEY	
7	One (1) UNIVERSAL JOINT IN 1/2" SQ. DRIVE, OVERALL LENGTH: 78 MM. MAKE: GRIPHOLD / MEKASTER / STANLEY	
8	One (1) SWIVEL HANDLE IN 1/2" SQ. DRIVE, OVERALL LENGTH: 380 MM. MAKE: GRIPHOLD / MEKASTER / STANLEY	
9	One (1) L-HANDLE IN 1/2" SQ. DRIVE, OVERALL LENGTH: 210 MM. MAKE: GRIPHOLD / MEKASTER / STANLEY	
10	One (1) ADAPTER 3/4" F x 1/2" M MAKE: GRIPHOLD / MEKASTER / STANLEY	
11	One (1) ADAPTER 3/4" M x 1/2" F MAKE: GRIPHOLD / MEKASTER / STANLEY	

12	One (1) each of UNIVERSAL SOCKET WRENCH, 1/2" DRIVE, SIZE: 1/4", 3/8", 1/2", 9/16" & 5/8" (TOTAL 5 NOS.) MAKE: GRIPHOLD / MEKASTER / STANLEY
13	One (1) each following TORQUE WRENCHS CAPACITY: 0-250 LBF-FT CAPACITY: 0-1000 LBF-FT MAKE: GRIPHOLD / MEKASTER / STANLEY
14	One (1) SCREW DRIVER ENGINEER PATTERN: 200 X 10 MAKE: GRIPHOLD / MEKASTER / STANLEY
15	One (1) SCREW DRIVER PHILLIPS PATTERN: 8 X 150 MAKE: GRIPHOLD / MEKASTER / STANLEY
16	One (1) each of ADJUSTABLE WRENCH: 8" & 12" respectively. MAKE: GRIPHOLD / MEKASTER / STANLEY
17	One (1) set of ALLEN KEYS 1.5 MM TO 10 MM MAKE: GRIPHOLD / MEKASTER / STANLEY
18	One (1) COMBINATION PLIER: 6" MAKE: GRIPHOLD / MEKASTER / TAPARIA / EVEREST.
19	One (1) LONG NOSE PLIER: 160 MM MAKE: GRIPHOLD / MEKASTER / STANLEY
20	One (1) CIRCLIP PLIER -INTERNAL: 175 MM MAKE: GRIPHOLD / MEKASTER / STANLEY
21	One (1) CIRCLIP PLIER -EXTERNAL: 175 MM MAKE: GRIPHOLD / MEKASTER / STANLEY
22	One (1) CENTRE PUNCHES: 4" MAKE: GRIPHOLD / MEKASTER / STANLEY
23	One (1) BALL PIER HAMMER: 200 GMS MAKE: GRIPHOLD / MEKASTER / STANLEY
24	One (1) PLASTIC TIP HAMMER: 25 MM DIA MAKE: GRIPHOLD / MEKASTER / STANLEY
25	One (1) FEELER GAUGE-300 MM (26 BLADES) INCH AND MM COMBINED MAKE: GRIPHOLD / MEKASTER / STANLEY
26	One (1) FOOT RULE: 12" (Stainless Steel)

27	One (1) MEASURING TAPE: 3 MTS (METALLIC)
28	One (1) DIAGONAL CUTTING PLIER: 160 MM MAKE: GRIPHOLD / MEKASTER / STANLEY
29	One (1) each THREAD GAUGE: For BSW, METRIC & UNC threads. MAKE: GRIPHOLD / MEKASTER / STANLEY
30	One (1) OUTSIDE CALIPER 6" MAKE: MAKE: GRIPHOLD / MEKASTER / STANLEY
31	One (1) INSIDE CALIPER 6" MAKE: GRIPHOLD / MEKASTER / STANLEY
32	One (1) SCREW EXTRACTOR SET (HEXAGONAL) CONTAINING DRILL SIZE IN INCHES: 1/4", 3/16", 3/8", 5/16", 7/16", 9/16", 1/2", 5/8", 3/4", 11/16", 1/8", 13/16", 7/8" (TOTAL 13 NOS) MAKE: SNAP ON
33	One (1) SPIRIT LEVEL 30 CM (12")
34	One (1) ULTRA LOW FLAT JACK REMOTE CONTROL COMPLETE WITH HYDRAULIC HAND PUMP, PRESSURE RELIEF VALVE, PRESSURE GAUGE AND 2.5 TO 3 MTS HYDRAULIC HOSE. CAPACITY: 10 TON, CLOSED HEIGHT: 40-43 MM, STROKE: 10-12 MM, RAM DIA: 34-38 MM, WEIGHT OF THE JACK: 2 TO 4 KG. MAKE: GRIPHOLD / MEKASTER / STANLEY
5.1 A	RETROFITTING OF CAT 3512B ENGINES: Oil India Limited (OIL) shall utilize its existing fleet of CAT 3512B engines in the proposed 2000 HP VFD Rigs. From its existing fleet of engines OIL shall supply 10 (ten) Nos. of CAT 3512B engines only for retrofitting in the proposed 05 (five) Nos. 2000 HP VFD Rigs. 02 (two) Nos. CAT 3512B-1000 RPM engines per rig shall be retrofitted and coupled to the supplied new alternator inside the acoustic enclosure. The running hours of the engines are given in APPENDIX-AA-VII. The engines will be retrofitted in OIL's premise for which OIL will provide all necessary support like welding service, transport service, crane service and supply of consumables. The load testing will be done at drilling well site. The scope of supply and work is detailed below. Note: Reference to Section 5.1.A of the Technical Specification for Retrofitting of CAT 3512B 1000 RPM engines, OIL will not be responsible for any damage caused to the electrical equipment supplied by the bidder during commissioning of the VFD rig beyond the CAT 3512B 1000 RPM engines. OIL's responsibility shall be to provide the engines in good running condition and rectify any malfunction in the engine. The vendor may deploy authorized OEM representatives of the engine during the commissioning of the retrofitted engines. However, it shall be the responsibility of the vendor to take all reasonable steps and carry out all necessary checks and the same to be documented prior to putting the Alternator/PCR on electrical load.

5.1 A.1	Description	Oil India Limited intends to retrofit existing CAT 3512B engines in the proposed new VFD Rig Power Packs. The same shall be coupled with new alternators. Existing engines are ECM controlled with MPD panel. The existing engines shall be coupled to alternators supplied along with the rig package and made compatible with VFD PCR by the bidder. The power packs consisting of Engines and Alternators are to be integrated by the bidder with the VFD PCR for speed & load control of engine over its designed speed range of 1000 RPM
5.1 A.2	Existing Engine	Make: Caterpillar Model: 3512 B Rated BHP: 1250 @ 1000 RPM Type of sump: Shallow Rated RPM: 1000 Control System: Advance Diesel Engine Management - III, ECM with electronically controlled unit injectors, controlled by electronic/ PLC 24 V DC Battery along with external Charging system. Flywheel & Flywheel Housing: Flywheel Housing: SAE#00 Flywheel: SAE No. 00 Rotation: SAE Standard Rotation No. of Flywheel Teeth: 183 Speed Sensing: Magnetic Pick up (MPU), 3050 Hz at 1000 RPM Input signal to ECM: 0-200 mA having PWM Mounting Position of MPU : Flywheel Housing
5.1 A.3	Scope of Supply	-Complete Alternator -Complete MPU and accessories -Engine-alternator flexible coupling -Base skid, Mounting skid for engine and alternator & acoustic enclosure -Foundation bolts and adjusting shims

		-Exhaust muffler, extended stack and supports for each retrofitted engine. Note: Any additional item, not included in the above but required for retrofitting and commissioning of the engines, will be provided by the bidder.
5.1 A.4	Scope of Work	The successful bidder shall unitize the CAT 3512B engines supplied by OIL in the new cap on type canopy with acoustic enclosure and couple the same with the new alternator supplied. Footprint of the engine are as per APPENDIX-AA-VIII. Unitizing existing CAT 3512 B engines to alternators in the power pack with suitable flexible coupling mechanism. The flexible coupling mechanism shall be identical to the ones in the new power packs. Alignment of engine to alternator. Integrating engine control ECM with VFD PCR for speed and load control. The signal to the CAT 3512B engine from the VFD PCR should be readable by the engine ECM and the bidder to carry out necessary modification required if any. It should be able to run in synchronization with the new power packs over its entire loading range. Commissioning and load testing of the complete power pack in OIL operational areas.
5.2	250 KVA AUXILLARY GENSET	
5.2.1	Generation Requirement & Technical Specification	
5.2.1.1	One (01) number Diesel Generating Set per Rig of capacity 250 kVA capacity to be connected for running equipment like Motor Driven Air Compressor, BOP Motor, Hydraulic cylinder Motor (for raising mast, refer Section 1.8.1) etc during Rig up / Rig down / Production testing phase in addition to lighting load.	
5.2.1.2	Caterpillar / F G Wilson (Caterpillar brand) / Cummins / Mahindra Powerol /Sudhir Power/Powerica Ltd/KOEL/Greaves Inline 6 cylinder, 4-Stroke, Water-Cooled, Turbocharged, after cooled, electronically controlled direct injection, diesel engine of 1500 RPM conforming to ISO 3046 / BS 5514 with counter clockwise rotation as viewed from flywheel end. Engine must produce required power for rated kVA to generate 200 kW (250 KVA) at 50Hz, Pf >= 0.8. Bidder must provide detail information with literature.	
5.2.1.3	Engine should be designed to meet ISO 8528-5 transient response requirements and accept 50-60% percent rated load in one step. The engine should be suitable for continuous duty with an overload capacity of 10% for a period not exceeding one hour per 12 hours running without undue heating or any other mechanical trouble.	

5.2.1.4	The Engine should conform to specifications IS: 10000 / BS: 5514 or equivalent. Each Generating set should be complete with compatible AC generator [refer details of Alternator under heading Generator in Electrical section] is for 50 cycles operation at the site conditions given below: Maximum ambient Temperature: 50° C Minimum ambient Temperature: 2° C Maximum Relative Humidity at 35°C: 95% Maximum Altitude above mean sea level: 150 M Average annual rainfall: 343 cms.
5.2.1.5	Each Generating set should comprise of an Engine coupled with Alternator that shall be in unitized condition and enclosed in a single, weather proof, skid mounted Acoustic Enclosure. Engine and Alternator should be: a) Compatible to power and torque trend (varying loading pattern), responsive to instantaneous load and torque changes including no load. b) Easily serviceable in-situ. c) Of up-to-date technology. d) Shall be able to withstand the shock and vibration associated with the frequent movement of rigs from place to place and also to withstand severe environmental conditions including heat and humidity. The Alternator rotor shall be dynamically balanced and engineered to withstand 125% load over normal load.
5.2.1.6	The engine should be equipped with: a) Air handling system having dry type Air Cleaner with restriction indicator. b) Exhaust system with exhaust manifold, extended stack height as per CPCB (India) norms, SS exhaust flexible connection, PESO approved Spark arrestor cum Silencer. c) Cooling system with Radiator, Fan, water pump etc. designed & tested for 50°C ambient temperature, high radiator coolant temperature engine trip & low coolant level engine alarm with trip. The radiator should be having capacity of at least 20% in excess of total heat rejection of the engine.

	d) Instrument / Control panel should have Oil & Fuel pressure gauge, Oil, Water & Exhaust temperature gauge, Electronic Tachometer with R/Hrs meter etc. There should have sufficient space for maintenance and repair of the Instrument / Control Panel. Bidder should provide detail about the Instrument / control panel system. e) Safety Shut Off system should be equipped with Alarm for Low lube oil pressure, High coolant temperature, Engine over speed etc. Bidder must mention the Safety Shut Off system offered for the engine & provide detail information with literature. f) The critical wiring should be in a separate rodent proof conduit with proper marking from other wiring. All the wirings must have proper ferrules / labels / numbers for identification of the wires. g) Engine Aspiration with Turbocharger, Air to Air after-cooler etc. h) Lube system with full flow Spin on lube oil filter, adequate capacity in line lube oil centrifuge, lube oil pump, sump, oil cooler, breather, lube oil drain pump etc. i) Fuel system with dual fuel filter having Pre filter, reusable type water separator including drain valve & water in fuel (WIF) sensor and main filter. Integral fuel tank of standard design capacity provided with drain plug, air vent, inlet filling port [outside the enclosure] with locking facility & outlet connection, level indicator, provision for cleaning etc. j) Starting system with Electrical starter motor, battery charging alternator, 2 nos. heavy duty battery, heavy duty battery terminals. k) The cylinders should be wet type easily replaceable
5.2.1.7	Engine Harness wirings must be of OEM supplied.
5.2.1.8	The specifications of Fuel to be used by the Engines are as follows: Diesel fuel Compatible with BS VI fuel standards
5.2.1.9	The bidder should specify the following information along with relevant performance curves with conditions: a) Gross Horse Power developed at rated RPM b) Deduction for Altitude, Temperature etc. c) Deduction for Fan and ancillary equipment d) Net HP available at rated RPM & site conditions. e) Specific Fuel Consumption at rated speed and Power and 110%, 75%, 50% and 25% of full load.

5.2.1.10

Acoustic Enclosure:

The acoustic enclosure should be made of CRCA steel sheet, painted with inorganic zinc primer followed by polyurethane paint. The features of acoustic enclosure are as follows:

- a) It should be specially designed with high quality acoustic insulation material to meet stringent MoEF /CPCB norms that the noise pressure level of the generating set should not exceed 75 dB(A) measured at a distance of 01 (one) meter from the enclosure surface.
- b) The acoustic enclosure shall be designed to meet latest MoEF/CPCB noise level norms.
- c) The doors of acoustic enclosure must have SS hinges (not Al/Cl hinge) with inbuilt as well as external locking arrangement.

NOTE: Authorized agencies for MoEF/CPCB Certification: The following agencies are authorized to carry out such tests as they deem necessary for giving certificates for Type Approval and Conformity of Production testing's of DG sets and to give such certificates (bidder should follow latest information from the MoEF/CPCB site):

- i. Automotive Research Association of India, Pune;
- ii. Naval Science & Technology Laboratory, Visakhapatnam;
- iii. Fluid Control Research Institute, Palghat;
- iv. National Aerospace Laboratory, Bangalore;
- v. International Centre for Automotive Technology, Manesar, Haryana; and
- vi. National Test House (Northern Region), Ghaziabad, Uttar Pradesh.

Bidder must confirm in their offer that the offered Generating sets meet latest Indian Noise Pollution & Emission norms as follows & provide all the documents / certificates required to be obtained from MoEF / CPCB, India for operation of the supplied Generating set at OIL's site at the time of inspection:

- i. CPCB II (Central Pollution Control Board) norms as per G.S.R 771(E) dated 11.12.2013 and its further amendments.
- ii. CPCB / MoEF (Ministry of Environment & Forest) norms as per G.S.R 371(E) dated 17.05.2002 and its further amendments.

Bidder must provide valid Type Approval & Conformity of Production Certificate for the offered Generating set during Inspection or before dispatch.

5.2.1.11	Spare Parts for Engine of the Auxiliary Genset: A) OPERATIONAL SPARES: Bidder should recommend operational spares/ consumables required for running of each engine for 2000hrs. Bidder should also indicate unit price of each of the recommended operational spares which should be valid for a period of 5 (five) years from the date of commissioning of the first two rigs. However, these prices will not be considered for evaluation. MANDATORY SPARES: As per Appendix-AA-VI
5.2.1.12	ENGINE FAULT DIAGNOSTIC TOOLS: If any P.C based fault diagnostic system exists in the engine; bidder must confirm to supply both software & hardware including Laptop of the diagnostic system.
5.2.1.13	TEST CERTIFICATE & AFTER SALES SERVICE: Each Engine must be load tested at manufacturer's work & test certificate has to be provided along with the delivery of material. The engines shall be commissioned at site by the OEM's authorized dealer in India for which the bidder shall take all necessary measures to commission the same. The bidder shall carry out OEM recommended servicing during the Warranty period. The complete sets have to be load tested at manufacturers work & test certificate has to be provided along with the delivery of material. However, OIL reserves the right to witness the load test. The nature of after sales services, which can be provided by the successful bidder during initial commissioning as also in subsequent operation, should be clearly indicated.
5.2.1.14	SPECIAL TOOLS FOR ENGINE: The following OEM supplied Special tools (as per OEM recommendation) should be supplied along with the consignment for carrying out engine major overhauling jobs. These tools must be supplied in proper tool box. Specific descriptions, part nos., make, etc. shall clearly be indicated in the bid. i. Liner Puller – 1 set ii. Piston Insert tool – 1 set iii. Piston ring expander – 1 set iv. Injector puller – 1 set v. Timing adjustment tool – 1 set vi. Bearing puller for fan shaft – 1 set vii. Alternator Alignment Tool kit with Instruction Manual – 1 set viii. Heavy Duty Digital Multimeter – 1 no ix. Portable Digital Tachometer – 1 no

5.2.1.15	SPECIAL NOTES: a) All the accessories & fittings of engine viz. Radiator, Coolers, Silencer cum Spark Arrestor, Engine Harness Wirings & accessories etc., must be of OEM supplied with proof of documents. Bidder must confirm in their offer to provide documentary evidence from OEM regarding supply of the above-mentioned items at the time of PDI. b) Engine Harness wirings must be of OEM supplied. The critical wiring should be in separate rodent proof conduit with proper marking from other wiring. c) Detailed dimensional / GA drawings of the Power pack including footprint should be submitted along with the offer for technical scrutiny. d) Bidder should mention the make & model of the DG set offered along with technical brochure / leaflet and also confirm to provide after sales service through authorized service dealer of the DG set manufacturer.
5.2.1.16	Construction of Generating set: a) Base frame of the Engine & Alternator must be rugged & fabricated out of adequate size ISMC & not from sheet metal. b) Master Skid: complete DG set must be placed on a 2 (two) runner oilfield type skid fabricated out of ISMB200 & reinforced with min 3 (three) numbers cross member. Approx. 500mm wide working platform with 6mm chequered plate welded on it should be provided in all 4 (four) sides of the DG set skid. The ends of the skid should be projected out by 300mm and curved upwards. 125mm (5") NB X 8mm thick pipe with provision for lifting should reinforce the end of skid for tail boarding. c) Bidder must provide the detail drawing with dimension of the base frame, master skid, acoustic enclosure & schematic diagram of DG set along with the offer for scrutiny. d) Limiting dimension of DG set is approx. 7.0M (L) X 2.5M (W) X 2.5M (H). e) Limiting weight of each DG set is approx. 20 tons.
5.2.1.17	All auxiliary engines shall be of same make and model for all rigs.
5.2.2	ALTERNATOR SPECIFICATION: Refer to section 9 (Electrical systems)

5.2.3	CONTROL PANEL: Refer to section 9 (Electrical systems)
5.2.4	CONSTRUCTIONAL FEATURE
5.2.4.1	Entire unit should be mounted on the common skid. The skid should be three-runner oil field type with lifting lugs at the bottom and covered in a kiosk.
5.2.4.2	The kiosk should have base of 8-mm.thick checkered plates and the side wall should have 3 mm. thick sheet
5.2.4.3	The side wall should be supported at corners with 4" x 6"rectangular tubular of 8-mm. thickness and reinforced with 4 inch 'C' channel at spacing not more than 2.5 ft. distance all along the periphery.
5.2.4.4	Doors along the length should be flap type to provide with gaskets to render sufficient Acoustic attenuation to meet CPCB norms.
5.2.4.5	In the front and rear, hinged type doors to be provided. The top of the kiosk should be made of 3mm.thick steel sheet with lifting hooks and slopping (5degree on both side) type roof with 'C 'channels.
5.2.4.6	The roof should be removable type and having nut bolt type fixing arrangements. Inside the kiosk, sufficient walking space (after mounting the DG set) should be available but the Width should not exceed 8-1/2 fit. Tank for storing fuel at the safe place should be provided along with the piping arrangements for feeding the fuel to the engines and cleaning of fuel tank.
5.2.4.7	The capacity of the fuel tank should be 990 ltr. The kiosk to be painted with enamel paints of two coats above the zinc primer/polyester powder for outdoor duty. Outside colour should be smoke grey and inside should be light sky blue /or as per OEM's standard colour scheme.

	SECTION-6: RIG UTILITIES	
6.1	SCREW AIR COMPRESSOR (ELECTRICALLY DRIVEN)	
	MANDATORY SPARES: As per Appendix-AA-VI	
6.1.1	Supply and Commissioning of two (2) electrically driven and acoustically enclosed screw air compressor units of make IR/Sullair/Chicago Pneumatic or equivalent mounted inside the utility house to compress air for normal Rig operation utilization. Both compressors to be operational same time if required. The bidder shall calculate the maximum air requirement in the rig and match the compressor delivery and pressure accordingly.	
6.1.2	Complete packaged unit mounted on a anti vibration heavy duty skid in "ready to commission state"; shall include but not limited to; the compressor unit, prime mover, flexible coupling, air inlet system discharge system, compressor cooling and lubrication system, air oil separation system, instrument panel, safety/protective devices and controls, lifting eye bolts shall be provided for ease of lifting.	
6.1.3	Parameters: 1. Ambient temperature: 5 to 45°C 2. Relative humidity: 95% (up to) 3. Max. Allowable working pressure shall exceed the rated discharge pressure by at least 10 per cent or 1 bar, whichever is greater, but shall be lower than safety valve set pressure	
6.1.4	Compressor should include: a) Pressure Relief Valve b) Automatic Pressure Switch c) intercooler/after-cooler d) Suction Filter e) Oil Sight Glass, f) Drain Valve g) Non-Return Valve h) Starter for the motor	
	Technical Specification:	
6.1.5	Free Air Delivery	Min 300 CFM. Notes: The bidder shall give justification for offering the specific make and model of the screw compressor on the basis of the calculation of the maximum air requirement in the rig.
6.1.6	Discharge Pressure	150 psi (min)
6.1.7	Motor HP	One (1) Suitably rated (415 VAC, 3PH, 50Hz, TEFC)
6.1.8	Overall Dimension (max.)	Approx : L: 2020-2040 mm X B: 1150 - 1170 mm, X H: 1860- 1880 mm (+/- 5%)

6.1.9	Type	Rotary, twin screw, and single stage
6.1.10	Lubrication	oil flooded
6.1.11	Lobe arrangement	(4+6) preferably
6.1.12	Compressor overall efficiency	≥ 85%
6.1.13	Duty	Continuous
6.1.14	Noise level	70 dB (A) at normal load condition, one meter away from the machine
6.1.15	Air oil separator	oil carry over through discharge air of the oil separator system shall not exceed 1 litre per cubic meter per 100 h.
6.1.16	Discharge air temp	10-15 degree c (max.) above ambient (after cooler)
6.1.17	Air Vessel	Number of air vessels offered with Volume of each vessel shall be mentioned. However, the minimum volume must be 1.5 times of maximum total air required during operation. The bidder shall provide justification on the basis of the calculation of the maximum air requirement in the rig and match the capacity of air vessel accordingly.
6.1.18	Prime Mover: One (01) suitably rated electric motor, 3 phase, 415V, 50 Hz, continuous duty. There shall be provision of double and distinct earthing using GI Strip for motor and panel. MANDATORY SPARES: As per Appendix-AA-VI	
6.1.19	Compressor Block: Air cooled, male and female rotor dynamically balanced housed in stator casing supported by input / out shaft. Shaft sleeve and gears made up of forged steel with axial and thrust replaceable bearings. Blow down valve for venting of sump air pressure.	
6.1.20	Lubrication System: Self-priming, oil flooded with built in reservoir inclusive of:	
6.1.21	Oil strainer	

6.1.22	Oil filter : element type
6.1.23	Oil cooler: radiator type with built in after cooler
6.1.24	Oil level gauge/dipstick
6.1.25	Oil stop valve for preventing back flow
	Controls:
6.1.26	HMI panel continuous alpha numeric display of essential functions like pressure, temperature and other required parameters and fault signals
6.1.27	Constant speed mode of operation (preferable): unloads the compressor at predetermined pressure while the motor continues to operate
6.1.28	Automatic start-stop: makes or breaks electric contact to the motor at predetermined pressures.
6.1.29	Electrical control panels with soft starter (if provided for motor rating more than 75HP), control circuits like pressure switches solenoid valves, HMI etc. are to be provided which will be mounted inside housing of the compressor unit
6.1.30	Suitable for controlling the compressor operation Locally and Remotely
6.1.31	Built in protection systems, inclusive the following, should be provided for safe operation of the complete compressor system. a) Phase sequence protection relay b) Phase failure protection relay c) Motor overload Trip d) High Air / Oil Discharge Temperature Trip. e) Protection against starting on load f) MCCB and ELCB at incoming
	Electrical Assignment Panel:
6.1.32	The electrical panel mounted inside the utility bunk house should have following features
6.1.33	Incomer MCCB Rating: suitably rated
6.1.34	ON – OFF and RUN – STANDBY selector switches for both the compressors
6.1.35	Power supply to air dryer with ON – OFF and RUN – STANDBY selector switches
6.1.36	One (1) Ampere meter and One (1) Voltmeter with phase selector switch

6.1.37	One (1) Set Air Piping connecting the mechanical compressor, electrical compressor and valves for supply of air to diesel engines (for starting) Electrical controls and air receiver tank placed near the rig substructure for operation of rig accessories with suitable valves etc. Suitable air hoses should be provided at desired place.	
6.1.38	All screw air compressors offered shall be of same make and model for all rigs.	
6.1.39	Spares for four years normal operation of all screw air compressors should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4	
6.1.40	Technical specification sheet of the offered screw compressors shall be submitted along with the technical offer.	
6.2	AIR COMPRESSOR (DIESEL ENGINE DRIVEN) Diesel engine driven air compressor to be used for cold starting for normal rig operation. MANDATORY SPARES: As per Appendix-AA-VI	
6.2.1	01 (one) No. Complete packaged unit mounted on a anti vibration heavy duty skid in "ready to commission state"; shall include but not limited to the compressor unit, prime mover, belt drive, air inlet system discharge system compressor cooling and lubrication system, air oil separation system instrument panel, safety/ protective devices and controls, lifting eye bolts shall be provided for ease of lifting. The entire unit shall be housed inside the compressor utility hut.	
6.2.2	Atmospheric conditions Ambient temp. : 5-45 deg. C Relative humidity : Up to 95%	
6.2.3	Max. Allowable working pressure shall exceed the rated discharge pressure by at least 10 per cent or 1 bar, whichever is greater, but shall be lower than safety valve set pressure.	
	Technical Specification:	
6.2.4	Free Air Delivery	Min. 100 CFM
6.2.5	Discharge Pressure	140 psi (min)
6.2.6	Type	Reciprocating (2 stage) with intercooler.
6.2.7	Lubrication	Oil flooded Splash lubrication system
6.2.8	Compressor overall efficiency	≥85%
6.2.9	Duty	Continuous
6.2.10	Discharge air temp	10 -15 degree c (max.) above ambient (after cooler)
6.2.11	Prime Mover (Diesel Engine)	

6.2.12	Naturally aspirated / turbo charged water-cooled with wet type cylinder liner diesel engine designed to drive the compressor continuously at rated capacity.
6.2.13	Engine HP : To match the compressor delivery @ Min 100 CFM at 140 Psi (min)
6.2.14	Engine shall have min. 10% margin over the power-required by compressor under any operating condition after taking into account site condition. Charging system and alternator to be mounted on the engine. Maintenance free batteries to be supplied for starting the compressor engine
6.2.15	Scale/corrosion resistor and thermostatic valve for efficient engine cooling
6.2.16	Vacuum type indicator for air inlet filter maintenance
6.2.17	Fuel tank capable of running engine for 3-4 hours at full load with built in filling orifice, strainer/filler dipstick, level gauge (calibrated in litres), drain plug. Tank should be place at bottom with necessary piping.
6.2.18	Anti-vibration mountings, silencers, emergency stop
6.2.19	Spark arrestor
6.2.20	Instruments and controls - Gauges: lube oil pressure, temperature and cooling water temp, fuel level, tacho hour meter, starting on/off and emergency stop switch and ammeter
	Safety devices:
6.2.21	High temp. and pressure s/d switch for discharge air
6.2.22	Low lube oil pressure s/d switch for compressor and engine
6.2.23	High cooling water temp. s/d switch for engine
6.2.24	Engine emergency stop
6.2.25	Availability of spares during the normal life of equipment to be assured by the manufacturer
6.2.26	The engine should conform to the latest and relevant CPCB norms as applicable.
6.2.27	All engines and compressors offered shall be of same make and model for all rigs.
6.2.28	Spares for four years normal operation of all engines and compressors should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4.
6.2.29	Technical specification sheet of the offered engines and compressors shall be submitted along with the technical offer.
6.3	AIR DRYER UNIT MANDATORY SPARES: As per Appendix-AA-VI
6.3.1	One (1) Regenerative heatless Desiccant type twin tower Air Dryer designed with an inlet flow more than capacity of both the compressors combined 300 CFM minimum each @ 10.5 Kg/cm ² . Inlet pressure to be matched with compressor's delivery pressure.
6.3.2	The desiccant shall able to withstand a temperature at least 50°C of incoming air.

6.3.3	A particulate filter and a coalescing filter to knock out lub oil shall be installed upstream of the air dryer. The capacity of both the filters shall be able to handle the air delivery when both the compressors are operated.
6.3.4	Hot gas by pass valve should be provided to maintain a stable pressure dew point & avoid freezing during extended un-load run operation
6.3.5	Air dryer should be able to deliver compressed air to the machine according to ISO – 8573-1 having the following parameters of air: 1. Solid particles / dust: Class – 1 2. Humidity: Class – 4 3. Oil content: Class – 1
6.3.6	The bidder shall provide the schematic arrangement of the air compressing and drying system including all air vessel.
6.3.7	Bidder to specify the quantity by weight of desiccant for each air dryer
6.3.8	Bidder to supply extra 02 (two) times the quantity of desiccant by weight per air dryer
6.3.9	All electrical connections shall be of FLP type.
6.3.10	All air dryers offered shall be of same make and model for all rigs.
6.3.11	Spares for four years normal operation of all air dryers should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4
6.3.12	Technical specification sheet of the offered air dryer shall be submitted along with the technical offer.
6.4	UTILITY HOUSE
6.4.1	Utility House of suitable size within the limiting dimension 9 m (L) x 2.5 m (B) x 2.5 m (H).
6.4.2	Utility house should house two electric driven compressors, cold start compressor, air dryer, horizontal air receiver tanks mounted on a two runner skid horizontal with slinging arrangement.
6.4.3	The utility house shall be illuminated sufficiently with LED lights. Refer to Section 9 (Electrical Systems) for details of lighting specifications.
6.4.4	Provision for Roof (Complete/Section) opening for Motor/Compressor replacement should be provided.
6.4.5	Water shield ventilation on the roof to be provided.
6.4.6	All electrical connections shall be of FLP type.
6.5	AIR RECEIVERS/AIR TANKS: Total Volume of the Air Tanks should be minimum 1.5 times of maximum total air required during operation. The bidder shall calculate the maximum air requirement in the rig and match the capacity of air vessel/tanks accordingly.
6.5.1	Air receiver tank shall be horizontal having capacity of minimum 80 cubic feet each. The air receiver tank shall be designed for working pressure of 150 psi minimum or maximum working pressure of ancillary equipment (whichever is higher) & hydraulically tested at 1.5 times of maximum working pressure offered equipment, shall be connected after compressor, but before air dryer.

	Air tank(s) to be provided with individual safety valve and auto moisture drain etc. Hydro test and wall thickness, safety valve test/calibration certificate to be provided. Bidder to confirm the number and capacity of air tanks/receiver to be provided inside the utility hut and below the sub-structure /mast.
6.5.2	Skid mounted Horizontal Air Receiver(s) of suitable capacity to be placed near sub structure, complete with 2" NPT outlet, relief valve, pressure gauge Complete with relief valve, pressure gauge and drain valve.
6.5.3	1 extra tapping of 1.½" other than required pneumatic connections
6.5.4	Hydro test, NDT for welded joints, wall thickness, safety valve test/calibration certificates to be provided
	NB: Total volume of the Air receivers/tanks should be minimum 1.5 times of maximum total air required during operation. Also the bidder shall calculate the maximum air requirement in the rig and match the compressor delivery and pressure accordingly.
6.6	CELLAR PIT PUMP MANDATORY SPARES: As per Appendix-AA-VI
6.6.1	One (1) No. single stage Centrifugal pump having delivery of minimum 300 GPM (US) with min. head 15 m capable of drawing mud from cellar approx. 1.5 M deep and delivering mud to mud channel. Bidder to offer suitable centrifugal pump with sufficient NPSH to handle drilling fluid of max Sp. Gr. 2.0.
6.6.2	Flame proof motor to be provided for the Centrifugal Pump
6.6.3	All centrifugal pumps (cellar pit pump) shall be of same make and model for all rigs.
6.6.4	Spares for four years normal operation of all centrifugal pumps (cellar pit pump) should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4
6.6.5	Technical specification sheet of the offered pump shall be submitted along with the technical offer.
6.7	HIGH PRESSURE RIG WASH UNIT:
6.7.1	Two (2) nos. of electrically operated (single phase/three phase) high pressure (120 Bar) portable cleaning pump complete with 20 ft. long power cable & necessary fittings.
6.7.2	The pump should have 1" suction port & 40 ft. long delivery hose with nozzle for cleaning the draw-works & mast with water jet
6.7.3	The unit should be provided with an accumulator to absorb pulsation
6.7.4	Unit shall have the self-contained stainless steel reservoir of 100lts capacity with provision of draining and filling the water.
6.7.5	The unit shall be complete with all pressure piping, fittings, relief valves, strainer, filter and manifold
6.7.6	The total unit shall be mounted on wheel-mounted skid and portable type with provision to drag it
6.7.7	The unit shall work with any kind of water

6.7.8	Suitable protective mechanism shall be in built in to the system to protect the unit from high pressures	
6.7.9	Technical Specification	
6.7.9.1	Operating pressure	120 bar (+/- 10%) (Minimum)
6.7.9.2	Discharge	12 gpm @ 120 bar (Minimum)
6.7.9.3	Tank capacity	100 ltrs.
6.7.9.4	Size	1.5 m x 1.0 m x (Indicative)
6.8	TOOLS AND WRENCHES SET	
	For Each Rig Special Tools and Wrenches recommended by OEM for maintenance of equipment shall be provided along with following equipment –	
6.8.1	2 Sets each for Draw works, TDS, Iron Roughneck, Vertical Pipe Handler, BOP Transfer Cart, HPU, Compressors, Mud Cleaner	
6.8.2	2 Set each for Mud Pumps, LMSS, Engines, Mast and Substructure	
6.8.3	All Tools required for Maintenance of VFD House, ACPCR and all other Electrical Equipment – 04 set per Rig	
6.9	CASING LINE CUTTER	
6.9.1	1 no. of manually operated wire line cutter suitable for cutting 1½” & smaller size wire line (casing line).	
6.10	SOUND LEVEL METER	
6.10.1	1 (One) nos. of portable battery operated Sound Level Meter with Liquid Crystal Display (LCD) providing readings in 0.1 dB increments with 40-130 dBA measurement range	
6.10.2	The sound level meter should have low battery indicator, RFI-shielded construction, all required accessories, certified to be intrinsically safe & complete with storage case	
6.11	FIRE FIGHTING TANK:	
6.11.1	02 (two) Nos. Firefighting water tank of capacity 55 KL each per Rig shall be provided	
6.11.2	Closed top with 02 (two) nos. manhole, internal ladder	
6.11.3	The suction should have 4” connection with BFV. 01 (One) 4” Nos. drain valve with BFV.	
6.11.4	The tanks to be constructed having wall of 6 mm thickness and floor of 8 mm thickness. Material MS sheet is 2062. The side walls to be corrugated for maximum strength. Base skid to be fabricated out of ISMB 250 with three runners and cross members. Suitable oilfield type slinging arrangement to be provided at the ends.	
6.11.5	The tanks to be painted with anticorrosive paint both inside and outside	

6.12	AIR WINCH FOR RACKING BOARD: Air Winch for Racking Board: Preferred make as mentioned under Clause number 11.12 or any other make meeting BRC criteria A.1.2.3
6.12.1	One (1) Air Winch for Racking Board.
6.12.2	Performance based on 5:1 design factor and minimum operating pressure of 90 psi.
6.12.3	Line pull capacity (top layer) : 800 lbs.
6.12.4	Pendent control of 15 Mtr. length.
6.12.5	Enclosed construction which excluded dirt and dust, seals in oil and grease, and assures complete lubrication of all moving parts.
6.12.6	Reliable band type brake for holding rated load.
6.12.7	Reversible motor to permit full control of load by the throttle when lifting, lowering and pulling.
6.12.8	Throttle valve designed to eliminate air leakage when the winch is idle.
6.12.10	Shall be complete with one 25 mtrs. of wire rope of Breaking strength 5 times the rated line pull of top layer spooled on drum (IWRC, EIPS, 6 x 36, RRL, bright, Non-rotating) Line dia.: 1/4" for 600 kg capacity 7/16" for 1500 kg capacity
6.12.11	Complete fabricated material shall be sand blasted to white metal, primed with zinc and finished with 2/3 coats of urethane paint.
6.12.12	Following spares to be supplied per rig: Filter, Lubricator, Strainer, Regulator & set of airline fittings. Note: Quantity as per Appendix-AA-VI
6.13	AIR WINCH (MAN RIDER): One (1) ASME rated Man rider winch (Air winch) having the following features: Air Winch (Man-Rider/Utility): Preferred make as mentioned under Clause number 11.12 or any other make meeting BRC criteria A.1.2.3 Air Winch (Man-Rider): For Man-Rider, Design factor of 8:1. For Utility uses, Design factor shall be 5 : 1
6.13.1	Top layer capacity 2000 kg or 4400 lbs for utility & 1450 kg (3100 lbs) for personnel lifting.

6.13.2	1445 kgs (3180 lbs) capacity, man rider
6.13.3	23 mtrs. /min. (75 fpm) top layer line speed.
6.13.4	22 mtrs./min. (71 fpm) first layer line speed
6.13.5	Drum Brake & Automatic Disc Brake
6.13.6	Up and down limit switches
6.13.7	Winch mounted control with automatic spring return "lift & shift" double action throttle lever to prevents accidental starts
6.13.8	The sheet metal guard shall be provided on rope drum for safety of the operating crew.
6.13.9	122 M (400 ft.) of 12.7 mm (½ inch) wire rope spooled on drum(IWRC, EIPS, 6 x 36, RRL, non- rotating)
6.13.10	Complete fabricated material shall be sand blasted to white metal, primed with zinc and finished with 2/3 coats of urethane paint
6.13.11	Following spares to be supplied per rig: Filter, Lubricator, Strainer, Regulator & set of Airline fittings required for maintenance. Note: Quantity as per Appendix-AA-VI
6.14	AIR WINCH (DRILLING USE): Two (2) Air Winch of 5 short Ton (4.5 MT) Capacity suitable for use in hazardous environment. Air Winch (Drilling Use): Preferred make as mentioned under Clause number 11.12 or any other make meeting BRC criteria A.1.2.3
6.14.1	Specification:
6.14.1.1	Performance based on 5:1 design factor.
6.14.1.2	Line pull capacity (Top layer) : 11,000 LBS (5000 KG)
6.14.1.3	Line speed (Top layer) : 54 ft./min

6.14.1.4	Average air consumption: 700 CFM
6.14.1.5	Minimum working pressure : 90 psi or 6.2 Kg/cm2.
6.14.2	Overload sensing and shut off device for safety and protection shall be provided.
6.14.3	All controls shall be located on one side of drum for safer and easier operation.
6.14.4	The Air Winch should equipped with Automatic Disc brake with Drum brake, Winch mounted throttle control, Drum guard, spooling devices, Filter (with drain), Lubricator, Strainer and Muffler
6.14.5	Meets ANSI /ASME 30.7 Safety Standard.
6.14.6	Shall be complete with minimum 183 M (600 ft.) of wire rope of minimum Breaking strength 5 times of Rated capacity spooled on drum (IWRC, EIPS, 6 x 36, RRL, bright, Non-rotating)
6.14.7	The sheet metal guard shall be provided on rope drum for safety of the operating crew.
6.14.8	Complete fabricated material shall be sand blasted to white metal, primed with zinc and finished with 2/3 coats of urethane paint.
6.14.9	Following spares to be provided per rig: Filter, Lubricator, Strainer, Regulator & one set of Airline fittings required for maintenance. Note: Quantity as per Appendix-AA-VI
6.15	HYDRAULIC POWER UNIT (Electric Driven): (Technical specification & Drawing of the of Hydraulic Power Unit along with its intended position to be submitted)
6.15.1	Unless stated, all the rig equipment requiring hydraulic power shall be from common hydraulic power unit driven by electrical motor with standard controls. The electric motor for HPU unit shall be suitably rated (415 VAC, 3 PH, Ex. Certified for use in hazardous areas of drilling rigs). For details refer to section 9(Electrical systems).
6.15.2	The following shall be connected to the HPU: Iron rough neck, hydraulic cathead, Hydraulic power slip, Hydraulic BOP handling system, BOP Cart, Casing Running Tool, Casing Power Tong and Casing Stabbing Board.
6.15.3	HPU unit shall be provided in acoustic enclosures

6.15.4	Hydraulic Power Unit (Electric Driven): Features
6.15.5.1	HPU with stainless steel hydraulic fluid tank, vibration dampeners and removable noise hood.
6.15.5.2	Electric motor shall be equipped with overload protection, single phasing protection, Earth leakage protection etc. For details refer to section 9 (Electrical systems).
6.15.5.3	Automatic temperature control. The cooler starts automatically at an oil temp inside the tank of 38 deg C (100 deg F). The HPU unit automatically shuts down if the oil temperature inside the tank reaches 70 deg C (158 deg F). High and high-high fluid temperature alarm
6.15.5.4	Automatic Oil level safety. Unit automatically shuts down if the oil level inside the tank is too low. Oil level monitor/alarm and operation control in the Drillers cabin
6.15.5.5	Pressure and return connections with quick disconnect coupling
6.15.5.6	Maximum pressure: 3000 psi (206.84 bar)
6.15.5.7	Flow Rate: Bidder to Specify. (HPU shall be able to meet all hydraulic power requirement of above referred equipment)
6.15.5.8	Bidder shall provide suitable accumulator unit to meet hydraulic power requirement so that all equipment can be operated with surge. Also suitable pressure regulators for each equipment's pressure requirement
6.15.5.9	Return line equipped with contamination indicator. Offline fine-filter system
6.15.5.10	HPU unit shall be equipped with suitable stand by dual pump/motor (Ex. Certified). Secondary pump is for 100% redundancy.
6.15.5.11	Ambient temperature: -6 deg C to +55 deg C
6.15.5.12	Power supply (415 or 400V+/- 10%), 50 Hz with local control panel
6.15.5.13	Tank volume: Approx. 1000 Gallons (Bidder to confirm)
6.15.5.14	One manifold each for supply and return shall be provided at ODS side of suitable capacity with tapping provisions for all hydraulically operated equipment on and above derrick. Supply and return hydraulic lines of these equipment are to be connected from these manifolds.
6.15.6	HPU control should be integrated with rig control system to facilitate operation from drillers control system. There shall be provision for easy cleaning of coolers.
6.15.7	Following spares to be provided per rig:

	Hydraulic filters, air filters & hand pump for hydraulic top up. Note: Quantity as per Appendix-AA-VI
6.16	POL STORE WITH OIL DISPENSING SYSTEM
6.16.1	One (1) POL Store for storing min 20 barrels of various oil and grease required for operation. Store shall be equipped with one motorised and one manual oil dispensing system suitable for (210 L barrels).
6.17	BOP HANDLING SYSTEM (BOP CART)
6.17.1	Hydraulically operated BOP Handling system of capacity 75 Ton
6.17.2	Enable the BOP stack to be moved, tested and set at well centre without breaking down the stack
6.17.3	It raises a horizontally stored BOP stack to vertical and align it to existing wellheads. This includes 1/2 degrees over-rotation on the tilt, up to 36" of vertical travel to match wellhead elevations, over +/- 3" of transverse misalignment correction and up to 18 degree rotation of BOP to align wellhead bolts
6.17.4	It allows easy and rapid connection, support, and disconnection of the BOP from the frame when desired. The attachment collar clamps are pivoted and fastened with standard T-bolts
6.17.5	The empty BOP transport cart is short enough to remain beneath the drill floor while drilling, if desired
6.17.6	Steel track sections provide support and alignment between the base boxes and well centre allowing the BOP transport cart to be hydraulically driven to or from well centre with standard track
6.17.7	The BOP Transport system can easily lift the BOP up over wellhead studs, tilt to a horizontal position, and travel out from beneath the drill floor for tail boarding on to a truck or lifting with a crane for rig moves. Lift points for both crane and tailboard handling are provided
6.17.8	The BOP transport cart holds and protects the BOP in a horizontal position for truck shipping. BOP cart design criteria support 2G in any direction with the stack in a horizontal position
6.17.9	BOP Lift Frame is designed to be easily clamped to the specified BOP stack and it supports the stack vertically and horizontally on the cart. The topmost clamp mechanism fit immediately below the annular preventer base and takes the vertical loads of the entire stack. A rotating steel plate is immediately below the annular preventer that uses simple push/pull hydraulic cylinders to rotate the BOP by 9° either direction. The rotating plate is drilled for grease zerks and surface grooved to facilitate greasing to reduce rotational loads
6.17.10	The two lower clamps are designed for fast attachment to the BOP by swinging hinged arms across the back of the BOP and fastening with load binders. The BOP Lift Frame can be adjusted over a range of 0" to 42" in 6" increments and has a hydraulic lift of 36". This allows the

	base of the annular to be positioned from 11' - 7" to 18' - 1" above the base of the rig. The large adjustable range allows many BOP configurations to be chosen
6.17.11	The Tilt Frame guides the Lift frame when the BOP/lift frame is picked up off a wellhead and titled back 90 deg. to a horizontal position. Twin double-acting multi-stage cylinders perform the tilting function. A half degree over-stroke is provided for out of level conditions
6.17.12	Counterbalance valves are attached to the tilt and lift cylinders to control movement in case of any hydraulic failure
6.17.13	The tilt frame is sized to allow horizontal movement of the BOP/lift frame with the lift cylinders when the tilt frame is horizontal. This moves the CG location for lifting purposes
6.17.14	The Handling Cart is a hydraulically driven cart in which BOP lays horizontally for shipping. It also supports the BOP and tilting mechanism to rotate the BOP to vertical and locate the stack over a wellhead
6.17.15	The steel wheels are recessed to allow direct loading on truck beds. Additional lift frame supports are built into the cart to spread the BOP weight between the frame or wheels
6.17.16	Four lifting lugs are built into the cart for easy crane picks
6.17.17	The hydraulic control console is located on the side of the cart that is powered by the rigs HPU
6.17.18	The track sections are designed to support the BOP Handling cartloads and are braced off the existing sub bases. The centre track section is about 36 feet long and projects about 5 feet aft of the well centre. The BOP can be left attached to the transport cart or the lifting frame can be unpinned from the stack, lowered, and the cart stored beneath the drill floor
6.17.19	BOP Transporter capable of remaining pinned to the substructure base boxes while walking.
6.17.20	Above specification gives broad guidelines to the vendor to submit offer. Vendor to quote with all technical details

	SECTION-7: FUEL SYSTEM & LDO TANK MANDATORY SPARES: As per Appendix-AA-VI COMMON MANDATORY SPARES FOR FIVE RIGS: As per Appendix-AA-VI
7.1	Fuel Tanks:
7.1.1	02 (Two) nos. of horizontal cylindrical Fuel tanks with total capacity of around 40 KL each mounted on a two runner oilfield skid ISMB 250 with intermediate cross members. Material: Structural steel to be used. Construction of tank to be as per IS code: 10987:1992.
7.1.2	The diameter and the length of the tank shall be 8' dia x 30' long. Tank(s) should be provided with around 20" (approx. 600mm) man way, exterior and interior ladder, vent, magnetic level indicator, fill drain and suction coupling.
7.1.3	The bidder shall provide Tank Calibration Chart in centimetre scale fixed on the exterior wall. The tanks and the dip stick should be calibrated by government authority like Metrology Department of state level as applicable in India.
7.1.4	The tanks shall be complete with graduated scale on a suitable place so that fuel depth can be measured from outside with the help of magnetic level indicators
7.1.5	Bidder shall also provide hydraulic test certificate and thickness test certificate for both the tanks
7.1.6	There shall be provision of nut & bolt on the skid (two separate points on diagonally opposite side of HSD tanks) for earthing strip connection. Suitable Locking arrangement to prevent pilferage of diesel to be provided between tank outlet and pump suction.
7.2	<u>SKID FOR MOUNTING FUEL PUMPS</u> General Features:
7.2.1	Two (2) rotary/centrifugal fuel pumps driven by electric motors of suitable capacity (3~5 HP capacity, 415V, 3 Ph, 50Hz, Ex. Certified for use in hazardous areas along with PBS) with min. 250 LPM (discharge with 2 kg/cm ²), 2 fuel filters suction and discharge manifold with valves so that either pump can take suction from Tanker truck and fill tank or take suction from tank and fill Tanker Truck
7.2.2	Primary Filter made of paper / synthetic fibre shall be provided on the suitable location to remove solids up to five (5) micron.
7.2.3	All fuel pumps shall be of same make and model for all rigs.
7.2.4	Spares for four years normal operation of all fuel pumps and Primary Filters (as per Clause 7.2.2) should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4.
7.2.5	Technical specification sheet of the offered pump shall be submitted along with the technical offer.

7.3	<u>PIPING WITH NECESSARY VALVES AND FLEXIBLE HOSE</u>
7.3.1	One (1) No. externally located 2-inch common fuel supply line (made of 2" metallic line pipes & hoses) shall be used for supply of fuel from a 40 KL HSD Active Storage Tank. Each engine should be provided with 2-inch Ball Valve(s) (bronze) in the fuel supply line as well as in return line for isolation purposes at the time of installation & commissioning. The inlet fuel line of the engine shall be connected to the 2-inch common fuel line through Water separator & Pre-filter with an individual suction Valve.
7.3.2	<u>PRE-FILTER</u> : 01 (one) No Pre-filter to remove solid contaminants. Filter element should be replaceable type cloth/paper and should trap solid contaminants above 05 (five) microns. The filter element should hold sufficient dirt before it is changed.
7.3.3	<u>COALESCER</u> : 02 (Two) No. Coalescer unit to separate water from diesel shall be installed after the pre-filter. The coalescer units shall contain coalescing elements. The purpose of the coalescer element is to separate the water from the fuel. Drain valve to be fitted to let the separated water out. Both the units to be gravity fed from the active tank.
7.3.4	<u>FILTER TANKS</u> : These two filter tanks along with the two pump packages to be mounted on an oilfield type base skid, piped with valves for series flow through the tanks or to bypass the filters. The pumps will be manifold together so that fuel can flow through the filters when either of the pumps is running. Pressure gauges mounted on each of the tanks to measure pressure drop and know when to change filters. The system will also include an automatic drain for water, with necessary valves, unions etc. to make it a complete functional unit. The system should be connected to the main fuel storage with flexible hose suitable for handling diesel fuel. The total unit should be painted with a two-part catalyst setting epoxy. <u>Note</u> : The fuel transfer pumps and fuel filtration system to be mounted on the same skid with slinging arrangement
7.3.5	One (1) No. of externally located 2-inch common fuel return line (made of 2" metallic line pipes & hoses), similar to fuel supply line shall be used as a common fuel return line from individual engines to a 40 KL HSD Storage Tank.
7.3.6	Flow Meter shall be provided for measurement of Fuel Consumption of every tank.
7.4	<u>LDO TANK & DECANTING PUMP</u>
7.4.1	A standard LWC Tank, Capacity: 16KL, Skid mounted horizontal cylindrical LDO/LWC tank with decanting pump with connection to Suction & Pre-flush tanks
7.4.2	The tank shell to be fabricated out of 6mm MS sheet IS2062 and ends 8mm MS sheet.
7.4.3	The design, fabrication & testing of the LDO tanks should be as per API 650.

7.4.4	The LDO tank must be mounted on an oil field type skid. The skid should not exceed 6 Meter of length and 3 Meter of width. Base skid to be fabricated with ISMB 200. Provision of nut & bolt on the skid (diagonally opposite) for earthing strip connection.
7.4.5	The height of the LDO tank including the collapsible railings (in collapsed condition) from the ground level should not exceed 3 M.
7.4.6	The skid of the LDO tank should be Oil Field type having minimum three (3) runners & four (4) cross members of ISMB250.
7.4.7	The tank should be complete with ladder, working platform to take dip & collapsible railings around.
7.4.8	There should be provision of manhole for taking dip on the roof of the LDO tank as per API 650.
7.4.9	There should be two numbers of drain plugs with valve, one on the front and another on the back side of the LDO tank with nil dead volume.
7.4.10	The decanting pumps should be gear type pump having a capacity not less than 250 Litre per minute and minimum 2 kg/cm ² discharge pressure (head).
7.4.11	All Electrical Equipment, including the motors, starter panels, cable gland etc. of the decanting pumps shall be Explosion proof type and be suitable for use in hazardous areas of Zone 1/2 and Gas group IIA & IIB of Oil Mines and shall conform to IS/IEC/EN:60079-0:2011 & IS/IEC/EN:60079-1:2007.
7.4.12	Motor: Explosion proof electric motor of suitable capacity (minimum 7.5HP), 415 Volts, 50 Hz, 3 Phase. Refer to section 9 (Electrical Systems) for details of Electrical motors.
7.4.13	Starter Panel/ PBS: shall be Explosion proof type and be suitable for use in hazardous areas of Zone 1/2 and Gas group IIA & IIB of Oil Mines and shall conform to IS/IEC/EN:60079-0:2011 & IS/IEC/EN:60079-1:2007. For details refer to section 9 (Electrical Systems)
7.4.14	All decanting pumps shall be of same make and model for all rigs.
7.4.15	Spares for four years normal operation of all decanting pumps should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4
7.4.16	Technical specification sheet of the offered decanting pump shall be submitted along with the technical offer.

	SECTION-8: Water System
	MANDATORY SPARES: As per Appendix-AA-VI
8.1	WATER TANKS & CIRCULATING PUMP:
8.1.1	Three (3) water / chemical tanks fabricated and having approx. 9.9 M (L) x 2.285 M (B) x 2.250 M (H), having minimum capacity 50 Cum connected to 02 (two) Nos. centrifugal pumps (water booster) mounted on skid as mentioned below.
8.1.2	The tank to be constructed having wall of 8 mm thickness and floor 10 mm thickness. Material MS sheet is IS2062. The side walls to be corrugated for maximum strength. Base skid to be fabricated out of ISMB 250 with three runners and cross members. Suitable oilfield type slinging arrangement to be provided at the ends.
8.1.3	Master Skid for Water / Chemical Tank: One Master Skid having 4 (four) runners with a dimension of 3.05 M (10 ft.) wide x 9.75 M (32 ft.) long for placing the three water tanks. The skid should be fitted with two nos. of centrifugal pumps (as Water Booster) having specifications below.
8.1.4	Centrifugal, single/double stage, having mechanical seal, minimum flow rate of 80 cubic meter per hour with minimum 55 m head driven by suitable capacity electric motors (30~40HP capacity, 415VAC, 3Ph, 50Hz) with PBS located near the motor and complete with suction and discharge lines for operation of either or both pumps. The pumps to be connected to water tanks for circulating water for utility. Necessary electrical earthing with GI strip to be supplied along with the package. Suction of each pump should be minimum 6" from Floor of the skid. Note: Bidder should ensure that sufficient discharge is available on the derrick floor after considering all the hydraulic losses.
8.1.5	Two tanks should have open top and one tank should have covered top with two manholes covered with serrated grating. The tanks should have inside & outside ladder. Hand rails are to be provided for the two (2) open top tanks with bar grating platforms and walkway between the two tanks. All tanks top should be covered with anti-corrosive gratings
8.1.6	4" (100 mm) drain out with butterfly valve. Suitable outlet connection to Gauging water pumps (Multistage centrifugal pump)
8.1.7	All tanks should have provision for equalizer line of 4" (for inter connection)
8.1.8	Each open top tank to have 02 (two) agitators as described in agitator section- Refer Section 4.12
8.1.9	The overall dimension of the tanks including the agitators should not exceed the limiting dimensions.
8.1.9	All centrifugal pumps (water booster) shall be of same make and model for all rigs.
8.1.9	Spares for four years normal operation of all centrifugal pumps (water booster) should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4.
8.1.9	Technical specification sheet of the offered pump shall be submitted along with the technical offer.

8.2	WATER PIPING SYSTEM
8.2.1	Suitable piping for circulation of water from water tank to various place of usage (e.g. Mud Pumps, Mud Tanks and Derrick Floor via grasshopper system) shall be provided. Water piping should be fixed on the mud tank walls with interconnection using flexible hoses. Tapping to be provided for supply to cementing unit.
8.2.2	Piping (2") for transferring water from ground pit to water tank (min. 80 m) shall be provided. Bidder to provide water line layout showing various place of usage
8.3	SOURCE WATER PUMP
8.3.1	One (1) no. of Diesel Engine Driven Reciprocating type, Duplex, Double acting horizontal piston type pump flow rate of minimum 60 cubic meter per hour and a min head of 350mtr. Engines and pumps shall be mounted on an oilfield type mother skid for lifting.
8.3.2	The pump to be equipped with suitable suction, delivery lines, pressure relief line & valve.
8.3.3	Prime Mover (engine) of source water pump: Naturally aspirated / turbo charged water-cooled with wet type cylinder liner diesel engine fitted with PTO & belt drive system, designed to drive the source water pump at rated capacity.
8.3.4	Engine shall have min. 10% margin over the power-required by pump under any operating condition after taking into account site condition. Starting & charging system and alternator to be mounted on the engine. Maintenance free batteries to be supplied for starting the engine.
8.3.5	Engines shall be fitted with PESO approved spark arrestor, fuel tank (sufficient to run the engine for min 3 hours), Instruments and controls - Gauges: lube oil pressure, temperature and cooling water temp, fuel level, tachometer, starting on/off and emergency stop switch and ammeter
8.3.6	The engine should conform to the latest and relevant CPCB norms as applicable.
8.3.7	All engines and pumps offered against Source Water Pumps shall be of same make and model for all rigs.
8.3.8	1 (one) No. of Submersible Pump for source water per rig of following specifications: a) Discharge Capacity: Maximum Discharge rate of 10 m3/hour or above at a minimum head of 15 mtrs and capable of producing a maximum head of 40 mtr at a minimum discharge rate of approximately 2 m3/hour. Min. discharge- 4 m3/Hour b) Bore well Size :100 mm (4") diameter c) Size of Pump outlet: 50 mm (2") diameter. d) Normal available Source Water Level: 10 mtr to 18 mtr below Ground Level.
8.3.9	The submersible pump should be driven with a suitable submersible motor (to be vetted by Electrical)
8.3.10	Bidder has to submit technical specifications sheet and manufacturers' parts list of offered pumps and engines. Bidder to submit GA drawing of the Engine Driven Source Water Pump.
8.3.11	Spares for four years normal operation of all engines and pumps should be additionally included in the offer indicating item, part no. & quantity required as per Clause 11.4.

	SECTION-9: ELECTRICAL SYSTEMS
9.1	DRIVE MOTOR SPECIFICATION
9.1.1	DRAW WORKS MOTOR: Specifications:
9.1.1.1	AC drilling inverter duty rated, suitable for driving 2000 HP draw-works.
9.1.1.2	Make: Refer to section 11.12
9.1.1.3	Type: Ex-e, pressurized enclosure, suitable for use in hazardous Gas atmospheres, IP 44 (As per IS/IEC 60034-5).
9.1.1.4	Gas groups IIA & IIB
9.1.1.5	Quantity: Two (02) Number
9.1.1.6	Electrical rating: minimum 1100 HP.
9.1.1.7	RPM range at constant torque: To be specified by bidder
9.1.1.8	RPM range at continuous full horse power: To be specified by bidder
9.1.1.9	Temp. rise: T3 (200 C)
9.1.1.10	Duty: Continuous drive with constant torque, at 55 Deg. Centigrade
9.1.1.11	Stator insulation: Class H Vacuum Pressure Impregnated (VPI)
9.1.1.12	Bearing: Heavy duty anti friction bearing
9.1.1.13	Single shaft with hub
9.1.1.14	Main terminal box with IP56 protection minimum
9.1.1.15	Terminal box should be easily accessible for connection
9.1.1.16	Differential pressure switch (air flow relay/switch) for pressure sensing
9.1.1.17	Blower assembly with suitable capacity flameproof proof motor, 415 or 400 VAC, 50 Hz rated
9.1.1.18	Space heater
9.1.1.19	Motor electrical parameters to be provided by bidder
9.1.1.20	RTD provision for monitoring winding temperature with set of spare RTD
9.1.1.21	Maximum Torque: To be specified by bidder
9.1.2	Rotary Drive Motors Specifications:
9.1.2.1	AC drilling inverter duty rated, suitable for driving the rotary table.
9.1.2.2	Make: Refer to section 11.12
9.1.2.3	Type: Ex-e, pressurized enclosure, suitable for use in hazardous Gas atmospheres, IP 44 (As per IS/IEC 60034-5)
9.1.2.4	Gas groups IIA & IIB
9.1.2.5	Quantity: one (01) Number

9.1.2.6	Electrical rating: minimum 1100 HP.
9.1.2.7	RPM range at constant torque: To be specified by bidder
9.1.2.8	RPM range at continuous full horse power: To be specified by bidder
9.1.2.9	Temp. rise: T3 (200 C)
9.1.2.10	Duty: Continuous drive with constant torque, at 55 Deg. Centigrade
9.1.2.11	Stator insulation: Class H VPI
9.1.2.12	Bearing: Heavy duty anti friction bearing
9.1.2.13	Single shaft with hub
9.1.2.14	Main terminal box with IP56 protection minimum
9.1.2.15	Terminal box should be easily accessible for connection
9.1.2.16	Differential pressure switch (air flow relay/switch) for pressure sensing
9.1.2.17	Blower assembly with suitable capacity flameproof proof motor, 415 or 400 VAC, 50 Hz rated; The blower duct shall be placed such that it draws fresh air from suitable position
9.1.2.18	Space heater
9.1.2.19	Motor electrical parameters to be provided by bidder
9.1.2.20	RTD provision for monitoring winding temperature with set of spare RTD
9.1.2.21	Maximum Torque: To be specified by bidder
9.1.3	TOP DRIVE MOTOR Specifications:
9.1.3.1	AC motor, inverter duty rated, suitable for torque requirement as mentioned in Top Drive Section 2.
9.1.3.2	Clause deleted in final amendment.
9.1.3.3	Type: Ex-e, pressurized enclosure, suitable for use in hazardous Gas atmospheres, IP 44 (As per IS/IEC 60034-5)
9.1.3.4	Gas groups IIA & IIB
9.1.3.5	Quantity: To be specified by bidder
9.1.3.6	Total minimum capacity: suitable to achieve torque range as mentioned in Top Drive Section 2
9.1.3.7	RPM range at constant torque: To be specified by bidder
9.1.3.8	RPM range at continuous full horse power: To be specified by bidder
9.1.3.9	Temp. rise: T3 (200 C)
9.1.3.10	Duty: Continuous drive with constant torque, at 55 Deg. Centigrade
9.1.3.11	Stator insulation: Class H VPI
9.1.3.12	Bearing: heavy duty roller bearing, re-greasable
9.1.3.13	Single shaft with hub
9.1.3.14	Main terminal box with IP56 protection minimum
9.1.3.15	Terminal box should be easily accessible for connection
9.1.3.16	Differential pressure switch (air flow relay/switch) for pressure sensing

9.1.3.17	Blower assembly with suitable capacity explosion proof motor, 415 or 600 VAC, 50/60 Hz rated
9.1.3.18	Space heater
9.1.3.19	The main motors and auxiliary motors positioning should be such that greasing inlet and outlet should be accessible in the rig up condition (if the motors are re-greasable)
9.1.3.20	Motor electrical parameters to be provided by bidder
9.1.3.21	RTD provision for monitoring winding temperature with set of spare RTD
9.1.3.22	Maximum Torque: To be specified by bidder
9.1.4	MUD PUMP DRIVE MOTORS: Specifications:
9.1.4.1	AC drilling inverter duty rated, suitable for driving the Mud pump.
9.1.4.2	Make: Refer to section 11.12
9.1.4.3	Type: Ex-e, pressurized enclosure, suitable for use in hazardous Gas atmospheres, IP 44 (As per IS/IEC 60034-5)
9.1.4.4	Gas groups IIA & IIB
9.1.4.5	Quantity: Refer to Section 4.
9.1.4.6	Electrical rating: minimum 1100 HP
9.1.4.7	RPM range at constant torque: To be specified by bidder
9.1.4.8	RPM range at continuous full horse power: To be specified by bidder
9.1.4.9	Temp. rise: T3 (200 C)
9.1.4.10	Duty: Continuous drive with constant torque, at 55 Deg. Centigrade
9.1.4.11	Stator insulation: Class H VPI
9.1.4.12	Bearing: Heavy duty anti friction bearing
9.1.4.13	single shaft with hub
9.1.4.14	Main terminal box with IP56 protection minimum
9.1.4.15	Terminal box should be easily accessible for connection
9.1.4.16	Differential pressure switch (air flow relay/switch) for pressure sensing
9.1.4.17	Blower assembly with suitable capacity explosion proof motor, 415 or 400 VAC, 50 Hz rated
9.1.4.18	Space heater
9.1.4.19	The draw-works and rig pump motors shall be of the same make, model and power rating such that interchangeability of the motors is maintained
9.1.4.20	Motor electrical parameters to be provided by bidder
9.1.4.21	RTD provision for monitoring winding temperature with set of spare RTD
9.1.4.22	Maximum Torque: To be specified by bidder

9.1.5	STATUTORY REQUIREMENTS FOR THE VFD MOTORS:
9.1.5.1	The motors & cable gland shall be suitable for use in oilfield hazardous area, Zone-1 & Zone-2 and Gas group II-A & II-B of oil mines and shall confirm to IS/IEC/EN: 60079-0:2011 & IS/IEC/EN: 60079-7 or IS/IEC/EN: 60079-2 standard.
9.1.5.2	Test reports/ Certificates confirming to the above relevant standards from an Indian government laboratory or NABL accredited laboratory or IECEx accredited laboratory or ATEX notified body, which is not a part of the manufacturer's facility shall be submitted along with the bid and also with the supply of the materials.
9.1.5.3	In case the bidder is unable to provide the test reports/ certificates at the time of bid submission, then the bidder has to categorically confirm in their offer that "Test reports/ certificates will be submitted along with the supply of materials".
9.1.6	AUXILIARY MOTORS
9.1.6.1	Motors shall be rated for 415 or 400 Volts 3 phase AC, 50 Hz supply
9.1.6.2	All motors are to be flameproof, weather proof and conforming to minimum IP56 suitable for use in Zone 1 & 2, Gas groups IIA & IIB. Hazardous areas of oil mines
9.1.6.3	Motors shall be fitted with FLP/Exp double compression cable glands, terminal studs and earthing leads for connection to common earth bus. Plug-in type connections are not permissible at motor end.
9.1.6.4	Capacity: All auxiliary motors shall be per OEM design requirement, until otherwise specified
9.1.6.5	Motors electrical parameters: To be specified by the bidder
9.1.6.6	Make: Bharat Bijlee, Kirloskar, Marathon motors, Crompton Greaves, ABB, Cemp, Nidec, Siemens, LHP, WEG or equivalent.
9.1.6.7	As maximum efficiency of motor is achieved at 75% of rated load, the motor capacity (HP or KW) shall be designed accordingly.
9.1.6.8	All motors shall be supplied with local Push Button Station (PBS). The details of PBS have been included in section 9.5.3.10.3 of Electrical Specifications. Push Button Station (PBS) for all motors shall be located near the motor.
9.1.7	STATUTORY REQUIREMENTS FOR THE AUXILIARY MOTORS
9.1.7.1	The motors, all its auxiliaries & double compression cable gland shall be suitable for use in oilfield hazardous area, Zone-1 or Zone-2; or hazardous area [within 30 mtrs. as per OMR 2017(Regulation no.96(3))] and Gas group II-A & II-B of oil mines and shall conform to IS/IEC/EN: 60079-0:2011 & IS/IEC/EN:60079-1:2007 standards.
9.1.7.2	Test reports/ Certificates confirming to the above relevant standards from an Indian government laboratory or NABL accredited laboratory or IECEx accredited laboratory or ATEX notified body, which is not a part of the manufacturer's facility shall be submitted along with the bid and also with the supply of the materials.
9.1.7.3	In case the bidder is unable to provide the test reports/ certificates at the time of bid submission, then the bidder has to categorically confirm in their offer that "Test reports/ certificates will be submitted along with the supply of materials".

9.2	ALTERNATOR
9.2.1	Alternator specification:
9.2.1.1	Rated voltage: 600VAC
9.2.1.2	Make: Refer to section 11.12
9.2.1.3	Capacity: As per OEM design requirement
9.2.1.4	Power factor: 0.7 lagging
9.2.1.5	Phases: Three phase, three wire star connected with isolated ungrounded neutral (neutral shall be floating), but neutral available at terminal box.
9.2.1.6	Frequency: 50 HZ
9.2.1.7	Frame Size & RPM: Compatible with the rig engines (Refer to engine section 5). The bidder shall be responsible to completely integrate the alternators with the engines.
9.2.1.8	Insulation Class: H
9.2.1.9	Enclosure: Alternator- IP 23 minimum; Terminal box- 44 minimum
9.2.1.10	Voltage regulation: $\pm 5\%$ (As per IS 13364-2)
9.2.1.11	Frequency regulation: $\pm 3\%$ (As per IS 13364-2)
9.2.1.12	Alternator waveform: Deviation factor: 5 % max; Crest factor: 1.41 ± 0.07 ; Form factor: 1.11 ± 0.05
9.2.1.13	Alternators shall be matched to the engines (Refer to Power pack section 5). They shall be of heavy-duty construction, designed for drilling applications, which require heavy duty motor starting and predominantly non-linear loads. The alternator shall be able to withstand the shock and vibration associated with the frequent relocation of drilling rigs, as also to withstand severe environmental conditions including heat and high humidity. Rotors should be dynamically balanced and engineered to withstand 125% over nominal speed.
9.2.1.14	The exciters shall be rated 1.25 times the full load conditions
9.2.1.15	Rotor and stator shall be VPI and dried
9.2.1.16	Stator leads shall be terminated on suitably rated copper straps (standoff connectors) for connection to load side
9.2.1.17	Plate for main cable entry should be of non-magnetic materials to avoid heating by generation of eddy currents, as single core power cable will be used for termination
9.2.1.18	Insulation barrier should be provided to separate power and control terminals
9.2.1.19	Two nos. eye bolts/ lifting lugs for lifting the machine should be provided on the main frame
9.2.1.20	Cable glands shall be provided for safe and proper entry of all cables

9.2.1.21	All the terminals shall be labelled properly
9.2.1.22	Alternator shall be provided with six (06) number of RTD
9.2.1.23	The rating plate of the alternator shall be as per relevant IS/IEC standard.
9.2.2	REPORT OF STANDARD TESTS FOR THE ALTERNATORS:
9.2.2.1	Reports of standard tests performed on the offered alternators (in accordance with IEEE std. 115, NEMA MG-1, MIL std. 705, relevant IS/IEC standards) shall be attached with the technical bid as well as and also with the supply of the materials.
9.2.2.2	In case the bidder is unable to provide the test reports/ certificates at the time of bid submission, then the Bidder has to categorically confirm in their offer that "Test reports/ certificates will be submitted along with the supply of materials"
9.3	CABLES
9.3.1	Features:
9.3.1.1	All the cables (power & control) for draw works, rotary drive, top drive, mast lighting, brake water cooling system and any other cable running up to the Derrick floor shall be suitable for cluster drilling operation. The length of the cables shall be sufficient to enable 3+1 cluster well on a straight line/ diagonally or to reach upto 100m from PCRs, whichever is higher.
9.3.1.2	Generator cables shall be single core multi stranded, tinned copper conductor, flexible having insulation grade of 1.1 KV of suitable size (depending on generator rating). The cable insulation shall be EVA (Ethyl Vinyl Acetate rubber) / EPR / XLPO (Cross linked Polyolefin) insulation and EVA / CSP sheathed. The size of the alternator cables shall be mentioned by the bidder.
9.3.1.3	Cables for AC VFD motor (from the outgoing of the inverter) shall be single core multi stranded, tinned copper conductor, flexible having insulation grade of 2 KV. The cable insulation and sheath material should be Type-P as per IEEE-1580. The cable shall be suitable to be used with VFD system (shall have shielding -copper tape/braiding). If cable without shield is used for VFD motors, same shall be approved by the specific VFD drive manufacturer. VFD Drive Manufacturer's Certification regarding the same (i.e. suitability of non- shielded type cables with their VFD drive) shall be submitted with bid for technical evaluation.
9.3.1.4	Suitable Top drive cables with auxiliary drive cables if any as per OEM design.
9.3.1.5	Auxiliary AC motor/ 3- phase electrical equipment cables shall be multi-stranded, 1.1 KV grade, flexible, EPR insulated, HOFR elastomeric CSP sheathed, either individually or collectively, 4 core tinned copper conductor cables, screened

9.3.1.6	Control cables shall be 1.1 KV grades, EPR insulated and HOFR elastomeric CSP sheathed/ Heavy Duty Arctic Neoprene sheathed, tinned copper flexible multi-stranded tinned copper conductor having multiple cores. Each individual core should be identifiable by means of colour / number and each core terminal shall be marked with cable markers / ferrules to identify the connections.
9.3.1.7	Cables for light fittings shall be EPR insulated and HOFR elastomeric CSP sheathed 3 core, 1.1 KV grade tinned copper conductor
9.3.1.8	Control system shall be supplied with suitable shielded twisted pair cable / Fibre optic cables for communication with the remote controllers in Driller & MP Consoles
9.3.1.9	All the cables including power, control, lighting etc. shall be supplied complete with suitable male/female plug/ connectors which shall go into proper male/female plug/connectors mounted in the PCRs, lighting fixtures, and motor Terminal boxes etc.
9.3.1.10	No soldered terminal socket will be allowed. All terminations shall be properly crimped
9.3.1.11	Bidder should provide efficient and quick cable laying arrangement for faster rig up/ rig down.
9.3.2	Statutory requirements for the cables
9.3.2.1	a) The power cables used for VFD Drilling motors shall be copper cables of min 2000 V grade. The cable insulation and sheath material should be Type-P as per IEEE-1580. The cable shall be suitable for use in oilfield hazardous area, Zone-1 & Zone-2 and Gas group II-A & II-B of oil mines and the cables shall conform to the provisions stipulated in line with IEEE-1580 Type-P with the latest amendments. b) All other electrical Cables to be used in the VFD Drilling Rigs other than the power cables used for VFD Drilling Motors shall be copper cables (braided or screened) of min 1100 volts grade, EPR insulated, CSP/NBR sheathed. The cables shall conform to the provisions stipulated in line with IS-9968-1 read with the latest BHEL specifications (OR12003, OR12002 & OR12005) as the case may be. If the standard of a particular type of cable is not available in India, the cables must comply relevant International standards (IEC 502) with latest amendments. Ref. to DGMS Tech. Circular (Electrical), (Approval) No. 17 dated 25/05/2015.
9.3.2.2	Test reports/ Certificates confirming to the above relevant standards from an Indian government laboratory or NABL accredited laboratory or IECEx accredited laboratory or ATEX notified body, which is not a part of the manufacturer's facility shall be submitted along with the bid and also with the supply of the materials.
9.3.2.3	In case the bidder is unable to provide the test reports/ certificates at the time of bid submission, then the bidder has to categorically confirm in their offer that "Test reports/ certificates will be submitted along with the supply of materials".

9.4	RIG LIGHTING SYSTEM
9.4.1	Rig Lighting Specifications:
9.4.1.1	The radial distance up to 30 m from wellhead shall be considered as hazardous area. All lighting load for the hazardous area shall have phase-phase voltage supply from lighting transformer (specified in section of electrical specification).
9.4.1.2	The following shall be considered to be in hazardous area: 1. Mast, racking board and aviation obstruction lighting 2. Rig floor/ draw works lighting 3. Pipe rack area lighting 4. Substructure lighting 5. Mud tank area lighting 6. Mud mix/ storage skid lighting 7. Mud pumps lighting 8. Fuel pump/ tank area lighting 9. Trip tank pump lighting 10. Choke manifold lighting 11. Water tank area lighting
9.4.1.3	Lighting for the area other than the hazardous area is to be considered general area lighting and shall be supplied with a phase-neutral connection from the isolation transformer (specified in section of electrical specifications)
9.4.1.4	The general area lighting shall include: 1. Power pack lighting 2. PCR surrounding area lighting 3. Air compressor/ utility house lighting 4. BOP unit lighting 5. General plinth and periphery lighting 6. Offices, chemical/ geological lab and crew camp lighting
9.4.1.5	All light fitting used in hazardous or non- hazardous area shall be LED type. The light fitting shall be weather proof having IP-65 (minimum)
9.4.1.6	Heavy duty Ex-d and weather proof light fittings shall be used in hazardous areas. Normal weather proof light fittings shall be used in all other areas for illumination.
9.4.1.7	For external source supply (in case the main 415 or 400 V bus is not energized), a changeover switch with mechanical and electrical interlock will be provided, serving both the 60 KVA transformers through suitable incomer circuit breakers.
9.4.1.8	All lighting circuits shall have RCBO/ RCD for current leakage sensitivity of 30mA. Vertical discriminating type RCDs shall be used wherever required.
9.4.1.9	Plug and receptacle disconnect shall be used for lighting to allow safe and easy removal of fitting for service or movement to another location day or night without interruption to other power or illumination circuits. Disconnects are to be provided at appropriate mast breaks, sub-separation etc. for easy rig up/ rig down of lighting system.
9.4.1.10	For mud tank lighting, suitable mounting/ hanging arrangement with tubular structures for well glass fittings with safety chain shall be provided on the tanks
9.4.1.11	All the light fittings shall include the necessary control gears (like vibration dampers, safety chain of 12 gauges, heat sink (if required) etc.) needed for smooth operation.
9.4.1.12	All the light fittings shall be provided with LED lamps/ PCB mounted LED of proper wattage.
9.4.1.13	A mast lighting socket board (Ex-d/Ex-p type) should be supplied at a convenient place on rig floor to facilitate easy connection/ disconnection for mast/ derrick area lights.

9.4.1.14	Aviation Light: 1. White Flasher unit: Aviation obstruction Ex-d type, IP-65 (minimum), day time white flasher unit shall be fixed atop the mast (near crown block). This unit shall be complete with controller, suitable cable, mounting hardware etc. Day time: 20,000 Cd, flasher type with 40 flashes per minute (White) Night time: 2,000 Cd, fixed (white) With automatic change over from day to night 2. Red aviation: Red aviation LED warning lamps, continuous glow, Ex-d, IP-65 (minimum), twin fitting to be fixed near the white flasher unit.	
9.4.2	The minimum number light fitting shall be as per the following list:	
9.4.2.1	Ex-d LED well glass light fitting for 30W (minimum) LED Lamps, Type-Screw Cap E-27/ PCB mounted LED for mast lighting, mud tank, water tank, rig floor lighting etc.	80 nos.
9.4.2.2	Ex-d flood light fittings for 250 W(minimum) LED lamps	16 nos.
9.4.2.3	Weather proof, 250 W (minimum) LED light for area lighting	24 nos.
9.4.2.4	Red aviation LED type warning lamp	02 nos.
9.4.2.5	Aviation obstruction (daytime aviation warning) white flasher lamp	02 no.
9.4.2.6	Portable small size "T" type light pole for mud tank and mud pump illuminations, 50 mm OD, 4000 mm height- fitted with anti-vibration devices	40 nos.
9.4.2.7	Galvanized and non-corrosive swaged type (stepped) steel tubular poles of length 9 m along with double brackets for fixing LED flood light fittings	14 nos.
9.4.3	Notwithstanding anything mentioned in table 9.4.2, the minimum illumination level in the rig shall be as follows:	
9.4.3.1	Pump-house shed	80 Lux
9.4.3.2	Derrick floor	100 Lux
9.4.3.3	Pipe rack area	60 Lux
9.4.3.4	Monkey Board	30 Lux
9.4.3.5	Compressor shed	100 Lux
9.4.3.6	Sub-structure	150 Lux
9.4.3.7	Engine room	60 Lux

9.4.3.8	Peripheral/ General area	20 Lux
9.4.3.9	Staircase	60 Lux
9.4.3.10	PCR	250 Lux
9.4.4	<u>STATUTORY REQUIREMENT FOR RIG LIGHTING SYSTEM:</u>	
9.4.4.1	The hazardous area light fittings & double compression cable gland shall be suitable for use in oilfield hazardous area, Zone-1 & Zone-2 and Gas group II-A & II-B of oil mines and shall conform to IS/IEC/EN: 60079-0:2011 & IS/IEC/EN:60079-1:2007 standards.	
9.4.4.2	Test reports/ Certificates confirming to the above relevant standards from an Indian government laboratory or NABL accredited laboratory or IECEx accredited laboratory or ATEX notified body, which is not a part of the manufacturer's facility shall be submitted along with the bid and also with the supply of the materials.	
9.4.4.3	In case the bidder is unable to provide the test reports/ certificates at the time of bid submission, then the bidder has to categorically confirm in their offer that "Test reports/ certificates will be submitted along with the supply of materials".	
9.5	POWER CONTROL ROOMS (PCR) Power control room (s) shall house the main Variable Frequency Drive panels, control panels for main drives, auxiliary motor panels, Generator control panels, Dynamic brake control panels, Programmable Logic Controller (PLC) /Single Board Computer (SBC) / Programmable Automation Controller (PAC) panel etc.	
9.5.1	The PCR design strategy shall be as following:	
9.5.1.1	PCR-1 shall contain:	
9.5.1.1.1	Generator control panels	
9.5.1.1.2	Diode Rectifier and VFD (inverter) panels	
9.5.1.1.3	Auxiliary motor control panels (auxiliary motors required for the main drilling motors like blowers and lube oil motors)	
9.5.1.1.4	Auxiliary brake controller/ chopper shall be housed in the PCR-1; however, braking resistors if used, shall be outside the PCR enclosure, but on the same skid. The braking resistor shall be corrosion resisting, Stainless steel Punched grid type resistor (no wire wound type braking resistors shall be acceptable).	
9.5.1.1.5	Plug socket compartments for interconnection with various main and auxiliary loads	
9.5.1.1.6	Any other electrical system like air conditioners etc., necessary for operation of the rig electrical equipment	
9.5.1.2	PCR-2 shall house:	
9.5.1.2.1	Diode Rectifier and VFD panels	
9.5.1.2.2	MCC for all other auxiliary motor starters/ feeders	
9.5.1.2.3	Soft-starter panel for auxiliary motors of 75HP or more	
9.5.1.2.4	Main transformers, 2 nos. lighting transformers and 1 no. isolation transformer	
9.5.1.2.5	Day light Aviation (white flasher type) warning light control panel	
9.5.1.2.6	Plug socket compartments for interconnection with various main and auxiliary loads	

9.5.1.2.7	Any other electrical system necessary for operation of the rig electrical equipment
9.5.1.2.8	NGR panel
9.5.1.3	PCR-3 (optional) shall house:
9.5.1.3.1	Diode rectifier and VFD (inverter) panels of Top drive system, Mud pump system & its auxiliaries
9.5.1.3.2	Auxiliaries of Top drive system, Mud pump system
9.5.1.3.3	Dynamic braking of Top drive
9.5.1.4	Notes:
9.5.1.4.1	Note-1: The VFD panels shall be strategically distributed among the PCRs for flexibility of operation.
9.5.1.4.2	Note- 2: There shall be an Isolation device (ACB/Switch) between the DC Bus bars/rectifiers placed in the different PCRs, such that DC Bus of the PCRs can be isolated and all the PCRs can be operated in this isolated condition.
9.5.1.4.3	Note- 3: HMI panel of PLC/SBC/PAC shall be present in all the PCRs for monitoring.
9.5.2	DIMENSIONAL DETAILS & CONSTRUCTIONAL FEATURES
9.5.2.1	Dimensional Details & Operating Environment
9.5.2.1.1	PCR (s) shall have the following dimensions for the structure (not including projections due to door handles, rain protection canopies, light pole brackets etc). Limiting Dimensions: Refer section 11.1 Weight – Refer section 11.1
9.5.2.1.2	The PCR (s) shall be capable of delivering rated output continuously in the following environmental conditions: i) Max. ambient temperature :45 degrees centigrade ii) Min. ambient temperate: 04 degrees centigrade iii) Altitude: 1000 m above sea level. iv) Relative humidity: 98% v) Atmosphere: Dusty
9.5.2.2	General construction features of PCRs
9.5.2.2.1	Body / House: The power control rooms should be outdoor type, weather proof, transportable steel housing with self-supporting skid suitable for onshore oil field application and should not be weighing more than the limiting Dimensions mentioned above. PCR house columns and ceiling frame to be constructed from structural steel seam welded. The outside shall be fabricated from twelve-gauge sheet steel. All corners are to be formed by bending, leaving no sheet edge exposed. Roof of the PCR should have proper slopes so that no water logging takes place during rainy season. The entire body of the PCR should be contained within the skid (without any extension out of the base skid). The roof of the PCR house shall be plain, without any protrusion. This is necessary for transportation of the PCR.
9.5.2.2.2	Skid: The Skid design shall incorporate at least 4(four) longitudinal channels with two mid channels kept sufficiently apart so that the unit can be placed evenly on narrow trailers (general width of trailers 2.4 to 2.6 meters only) with proper load distribution & balancing. Each

	longitudinal channel of a skid shall be of single length and shall have smooth finish underneath and curve finish at both the end, so that the skid can roll over smoothly on surfaces/truck body without any obstruction. The skid so designed should be sufficiently strong and properly welded at joints and should be able to withstand shocks while being handled and transported over rough and slushy roads/locations. Height of the joint used for the longitudinal members should be minimum 20 cm. Sufficient provision should be available at both ends for lifting the entire PCR (bottom lift arrangement). The skid shall be properly prepared, and painted with black coal tar epoxy paint with a final thickness of about 200 microns.
9.5.2.2.3	Thermal Insulation: Walls to be insulated with three-inch thick polystyrene block insulation/Glasswool/rock wool or any other suitable insulation. The floor and the wall with the receptacles and plugs will not be insulated. The inside surface of the walls shall be finished with a sandwich style insulating board three eighths of an inch thick with white pebble coating on the interior side and aluminium foil on the exterior side.
9.5.2.2.4	Panel line up: Panel line up can be provided in centre or wall attached on both sides with centre corridor. Supplier can offer their standard panel line up arrangement in the PCR. The panel line-up should be such that the PCR is load balanced for easy lifting, with CG at the centre of PCR. All components of the panels including Bus bars shall be easily accessible for maintenance and repair.
9.5.2.2.5	Plug Panel: Plug panel for the Generator and Drilling motor cables to be provided on the front end plug panel (facing the DWS). In case it is difficult to provide generator plug panel on front end then standard arrangement of supplier i.e. generator plug panel recessed type on the side facing power packs can be provided but height of such plug panel should be around 1.5 mtrs from bottom of the PCR. The Plug Panel(s) should feature shutter or doors which can be closed/ opened smoothly with all the cables plugged in, during normal running condition to avoid ingress of water inside the plug panels due to rain. Interior & exterior sides of plug socket compartment on the PCRs shall be adequately illuminated using 10 W LED light fixtures.
9.5.2.2.6	Indoor Lighting: Three numbers of 2X24 W LED lamps shall be used for aisle lighting of each PCR. Four- 230 volt Phase – Phase duplex receptacles (suitable for Indian style plug pins) to be included, two at each end of the house. The PCR shall be equipped with portable type emergency lamps which shall adequately light up the PCR in the event of a blackout. Additionally, two emergency lighting fixtures with EXIT sign to be also included at each end of the House. There shall be emergency floor-path illuminations (fluorescents strips) guiding towards exit doors of PCRs for emergency evacuation.
9.5.2.2.7	Doors: Two (2) mild steel doors with anti-panic locks will be furnished – one at each end and on opposite sides of the house. Both doors shall be designed to open to the outside by pushing on the crash bar. Doors should have a rubber sealing lining.
9.5.2.2.8	Miscellaneous: PCR should be designed for lifting from the bottom. A rubber insulating mat should be provided over the full floor area of the house. PCR to be provided with four brackets with suitable poles of height 3 meters at the upper four corners to hold flood light poles. The poles shall be detachable type.
9.5.2.2.9	Markings on the Body of PCRs: The Two ends of the PCR shall be labelled "Draw works End" and "Compressor End", as appropriate. The sides will be painted with Oil India's logo (to be provided), and the Words "Oil India Limited", "A Government of India Enterprise", "VFD PCR-1/2/3", "Rig #NAME ", the Purchase Order Number, Dimensions and weight of the PCRs, Manufacturer's Name and any Lifting Instructions.

9.5.2.2.10	Safety considerations inside the PCRs: Appropriate warning labels and safety provisions shall be made in the PCR to caution the operating and maintenance personnel against potential hazards and to prevent direct human contact to any live part or rotating part during operation. Proper hazard levelling shall be installed inside the PCR.
9.5.2.2.11	Bus bar: Both the PCRs shall be fitted with adequately rated, tinned copper bus bars, cable alleys/trays and vertical bus chambers. Hardware for all bus connections shall be of stainless steel bolts, aircraft locking nuts with nylon inserts suitable for bus bar operating temperature at full load or alternatively hardware with plain & spring washers to be used.
9.5.2.2.12	Finish: Surface finishing should be Commercial Metal Blast Grade (SSPC-SP-6) 1.5 to 2.5 mils anchor profile before primer painting. Primer and final top coat shall be of premium quality. Top coat colour will be urethane linear white. Over all dry film thickness of the painting should not be less than 8 mils (200 microns). Surface preparation and painting shall be adequate for the harsh rainy & humid environmental conditions.
9.5.3	MAIN COMPONENTS OF POWER CONTROL ROOMS:
<u>9.5.3.1</u>	<u>RIG CONTROL SYSTEM:</u> The integrated drilling control system for managing, controlling, and monitoring rig floor equipment in independent and activity-based operations shall be provided. The system shall be designed to allow operators to focus on Drilling, Tripping, and Stand-Building and ant other processes by providing an efficient and intuitive rig floor command centre. The rig control system shall have the following features for overall VFD drives control, interlock with auxiliaries and monitoring.
9.5.3.1.1	The Integrated System should be interactive through the use of colour-graphic data and control screens viewed on any of the Touch screen HMIs integrated into the Driller's workstations.
9.5.3.1.2	The main elements of the Integrated System are the i) Multi-Tool Control Cabinet, which houses PLC/SBC/PAC modules and network devices, Gateway interface with third party equipment, communication hardware etc. ii) operator workstations to drive the rig equipment.
9.5.3.1.3	The Rig control system shall connect via the network to touch screens and/or to workstation hardware (such as joysticks, brakes, control switches, speed pots etc.) to provide control and monitoring of rig floor equipment.
9.5.3.1.4	The Rig control system design shall avoid single point failures through a robust network with redundant touch screen HMIs running in parallel.
9.5.3.1.5	In case of failure of rig control system, the system will be provided with a 100% redundant/standby control system for uninterrupted drilling operation. Both the control systems shall have exact identical configuration in all aspects. Redundant/ Standby control system shall have each of following components (e.g. CPU/Power supplies/IO modules/Interface modules/Profibus or FO cable etc.) as that of the main Control system. The standby control system shall not be a part of the main control system. There shall be provision to bring the standby control system online immediately if the running control system is having any issues (with manual/hot standby type changeover).The bidder may submit their strategy to design such a standby control system.
9.5.3.1.6	The control system should be complete with all necessary software, hardware and remote communication capability. Control system software shall be licensed to Oil India Limited (OIL). Such Licenses should not have expiration dates. If any of the software is modified or altered for use in OIL's drilling rig, same shall be informed and shall be supplied to OIL. The software and hardware used in the control system shall be the latest available in the market with the provision to upgrade in future.

9.5.3.1.7	There shall be provision to log historic data of the inputs by the driller, readings of Draw works, Mud pumps, IRD, Top Drive, power packs etc. In addition, fault storage facility and history/ trend data should be available in the system for at least 48 hours with built-in self-diagnostic features.
9.5.3.1.8	Each PCR shall be equipped with touch screen HMIs for monitoring purpose. Both main HMI & extended HMI in PCRs shall be same as the one in the driller's workstation with only read mode (One should not be able to operate the drives from the HMIs in the PCR).
9.5.3.1.9	Control system for Top drive shall be same as that of Draw-works/mud-pump /IRD control system. Controls for all drilling equipment shall be integrated in same HMI/operator screen of Driller's workstation as well as the HMIs in the PCRs.
9.5.3.1.10	On-line UPS of suitable capacity for emergency backup of the Control System for a period of 30 minutes shall be provided. Two UPS's shall provide backup for the control system. The UPS's shall include bypass switches which will allow line power to be fed directly to the load in case of UPS failure.
9.5.3.1.11	Touch screen HMI Layout (Electrical parameters): The HMI in each PCR/Driller's workstation shall display some electrical parameters e.g. running status of Draw works, Mud pump, IRD, Top Drive, Alternators, Charging pumps, auxiliaries, and status of selection switches of Drillers' Console, Mud-pump console etc.
	HMI Layout (in the PCR):
9.5.3.1.11.1	Miscellaneous indicators
	System Communication OK
	Generator ON (For each Generator & and loading percentage)
	Ground Fault (600 VACS / 415 VACS/ DC BUS/ VFD)
	Power Limit status
	Running drives
	Rectifier/ converter panel indications
	Brake status
	Any Fault/ alarm
9.5.3.1.11.2	Variable frequency drives indicators (To be repeated for each VFD panel)
	VFD ON

	Bridge Temp Switch
	Blown Fuse
	Bridge Current (Amps)
	Bridge Voltmeter
	Speed Reference
	Fault/ alarms
9.5.3.1.11.3	Mud Pump Indicators (To be repeated for each Pump)
	MP Chain Oilers ON (if provided)
	MP Main Lubes ON (if provided)
	MP Blowers ON
	MP Liner Washers ON
	Charging Pump 1 ON
	Charging Pump 2 ON
	MP motors current (Amps), Voltage, speed, Torque etc.
	Fault/ alarm
	Mud pumps parameters (SPM, Total strokes, running hours, PSI etc.)
9.5.3.1.11.4	Draw Works/ Rotary Indicators (Repeated for Each Motor)
	DWA/DWB/ Rotary ON
	DWA/DWB/Rotary- Forward/Reverse

	DWA/DWB/ Rotary Blower ON
	DW/ Rotary Lube pump (s) ON
	Fault/ alarm
	Draw works Parameters (Current, Torque, speed, KW, voltage etc.)
9.5.3.1.11.5	Top drive Indicators
	Blowers ON
	Lube pump ON
	Fault/ alarm
	Top drive parameters (KW, Amps, Torque, rpm, throttle signal etc.)
9.5.3.1.11.6	Generator Cubicle Indicators (Repeated for each Generator Cubicle)
	Running Hours for Power packs
	KW and KVAR loading on the alternators (% loading)
	KWhr generated (energy meter data)
	Fault/ alarm
9.5.3.2	GENERATOR CONTROL PANEL (Quantity: Equal to the number of power packs used in each rig package): Generator control panel shall be suitable for operating, controlling & protecting the Engine-alternator sets. The generator control system shall be suitable for individual running or paralleling & load sharing with other power packs. There shall be one alternator control panel per alternator.
9.5.3.2.1	SALIENT FEATURES OF GENERATOR CONTROL PANELS: The Generator control system shall be suitable driving Alternators as specified in section 10.2.1(Alternator specification in Electrical systems) driven by Engines (as specified in Power pack section 5).

	GENERATOR CONTROL PANELS ARE TO BE FITTED WITH:
9.5.3.2.1.1	Generator control unit (package) for operation, control, metering and protection of Alternator/Engine
9.5.3.2.1.2	Withdrawable type incomer air circuit breaker (make: Siemens/ ABB/ Schneider/ Merlin Gerin/ Allen-Bradley) of sufficient nominal rating, breaking/ withstand and making capacity, manually chargeable, electric closing, with solid state trip unit, UV release and necessary auxiliary contacts. The interrupting rating of the breakers will minimally be 65 Kilo Amperes.
9.5.3.2.1.3	Breaker ON/OFF (Close/ Open) pushbuttons
9.5.3.2.1.4	Engine control switch OFF-IDLE-RUN (this switch shall duplicate with the OFF-IDLE-RUN switch in Engine control panel).
9.5.3.2.1.5	Engine speed & alternator voltage adjust provision
9.5.3.2.1.6	Real power sharing scheme
9.5.3.2.1.7	Reactive power sharing scheme
9.5.3.2.1.8	LED Indication lamps (with Low Voltage Glow Protection) -Gen. RUN, Gen. ON-LINE, Gen. SYNCH, Gen. FAULT, Engine FAULT etc.
9.5.3.2.1.9	Control Transformers, fuses, links, terminal blocks etc. (if any)
9.5.3.2.1.10	Main Bus bar to be designed for a minimum of 65 KA Fault current. It shall be able to take rated current continuously with simultaneous operation of all the drives and feeders.
9.5.3.2.1.11	Any other Electronic control system for remote communication with other devices/ equipment
9.5.3.2.1.12	Synchronizing controls consisting of reverse power relay, Phase rotation relay for phase sequence check on the generators with interlocking for synchronization, synchronizing lights and switch
9.5.3.2.1.13	Provision of displaying all parameters in Individual Generator cubical door mounted HMI Screen (Including Phase Volt, Phase current, Kilowatt, KVAR, Actuator Current, Actuator voltage and Exciter Current).
9.5.3.2.2	Each panel should be fitted with the following meters:
9.5.3.2.2.1	Alternator Ammeter 0-2000 A (selectable for R, Y, B phases)-Analog/ Digital type
9.5.3.2.2.2	Alternator Voltmeter 0-1000VAC- Analog/ Digital type
9.5.3.2.2.3	Alternator Kilo-watt meter, (-)150-0-1500 kW- Analog/ Digital type

9.5.3.2.2.4	Alternator Kilo-var meter, (-)150-0-1500 kVAR- Analog/ Digital type
9.5.3.2.2.5	Alternator power factor meter (-)1.0 – 0 – (+)1.0- Analog/ Digital type
9.5.3.2.2.6	Alternator Kilowatt-hour meter - Analog/ Digital type
9.5.3.2.2.7	Generator cumulative running Hours meter - Analog/ Digital type
9.5.3.2.2.8	Alternator temperature meter Six- (6) channel RTD meter to indicate generator winding temperature with alarm output relay contact to trip circuit breaker upon high temperature reading-Digital type
9.5.3.2.3	ENGINE GOVERNOR CONTROL: Engine governor system shall be as specified below:
9.5.3.2.3.1	Solid State Control Module / Fully Electronic Engine Controller (Governor) with 1. Response time of 0.8 second typical 2. Maximum load unbalance between engines (one hot, one cold) at all points, no load to full load, $\pm 5\%$ of its rated load 3. Working temperature range of -30°C to +55°C 4. No load to full load regulation of $\pm 1\%$
9.5.3.2.3.2	Speed feedback/MPU Signal Range: Bidder to specify (as required to control Power-packs as specified in section 5)
9.5.3.2.3.3	Engine throttle/actuator signal range: Bidder to specify (as required to control Power-packs as specified in section 5)
9.5.3.2.3.4	Suitable kW load sharing scheme should be implemented. Bidder to indicate scheme / type of load sharing employed.
9.5.3.2.4	ALTERNATOR VOLTAGE REGULATOR:
9.5.3.2.4.1	Voltage Regulator for brushless excitation system (the latest technology available)
9.5.3.2.4.2	The voltage regulation is to be limited to 3% droop (Max.)
9.5.3.2.4.3	Suitable KVAR load sharing scheme should be implemented. Bidder to indicate scheme / type of load sharing employed.
9.5.3.2.5	ENGINE/GENERATOR PROTECTION FEATURES:
9.5.3.2.5.1	The alternator protection features shall include: a) Overcurrent b) Overvoltage

	c) Over frequency d) Under frequency e) Reverse Power The protection for engines shall be inclusive of but not limited to the above-mentioned features.
9.5.3.3	CONVERTER/ RECTIFIER PANELS: Suitably rated Two (02) or more incomer /rectifier sections shall be provided in each PCR (strategically distributed) for supplying the VFD line-up, each of which shall include the following: Components of converter/ rectifier panels:
9.5.3.3.1	Suitably rated withdraw able type ACB with shunt trip, necessary auxiliary contacts.
9.5.3.3.2	06-pulse air-cooled diode bridge rectifier with insulated transparent sheet for safety purpose
9.5.3.3.3	Input Line Reactors of sufficient rating with insulated transparent sheet for safety purpose
9.5.3.3.4	High Speed semiconductor fuses with indicator switches
9.5.3.3.5	Heat sink-mounted temperature RTDs/temperature switches
9.5.3.3.6	AC & DC voltmeters/ multifunction meter
9.5.3.3.7	Surge suppressor system
9.5.3.3.8	Panel heater with thermostat
9.5.3.3.9	DC Ammeter
9.5.3.3.10	LED indication lamp indicating: System charged; fault etc.
9.5.3.3.11	Suitably rated panel fan shall be used to provide sufficient cooling
9.5.3.4	VFD/ INVERTER PANELS:
9.5.3.4.1	PCRs shall house air cooled VFD inverter panels of sufficient capacity, suitable for driving the following:
9.5.3.4.1.1	One 2000 HP Draw Works (driven by two min. 1100 HP AC VFD motors)

9.5.3.4.1.2	Three 1600 HP mud pumps (each mud pump driven by two min. 1100 HP AC VFD motors)
9.5.3.4.1.3	One Independent rotary drive (driven by one min. 1100HP AC VFD motor)
9.5.3.4.1.4	One Top Drive (driven by AC VFD motors)
9.5.3.4.1.5	One spare panel (functional and rated for draw works drive)
9.5.3.4.2	Each VFD inverter panel shall consist of the following main equipment:
9.5.3.4.2.1	Suitably rated DC MCCB/ACB/Isolator
9.5.3.4.2.2	DC Pre-charge Circuit (Manual pre-charging)
9.5.3.4.2.3	Voltmeter /Ammeter
9.5.3.4.2.4	LED indication lamp indicating: System charged; fault etc.
9.5.3.4.2.5	Inverter (s) modules, suitably rated
9.5.3.4.2.6	Semiconductor fuses with indicator switches
9.5.3.4.2.7	DC link filters
9.5.3.4.2.8	Control module (s), card (s), cables etc.
9.5.3.4.2.9	Communication modules
9.5.3.4.2.10	Operator panel/HMI in front fascia of panel
9.5.3.4.2.11	Emergency Stop Safety Relay
9.5.3.4.2.12	Cubicle Space Heater
9.5.3.4.2.13	Blower unit for cooling of the VFD panel
9.5.3.4.2.14	Fault alarm (on HMI /touch screen display of Driller's cabin & PCRs) with external electrical hooter and indication red lamp.

9.5.3.4.3	Notes:
9.5.3.4.3.1	The inverter panels shall be strategically distributed among the PCR's for flexibility of operation.
9.5.3.4.3.2	Top Drive Panel –Top Drive motor panels may be placed in an additional PCR, in which case, there should be a 600 VAC feeder with adequately rated ACB for feeding power to the Top Drive PCR.
9.5.3.4.3.3	Proper schemes for the following shall be employed: 1. Load sharing scheme by the two motors of a mud pump 2. Unbalance trip of Mud pump motors with alarm at Driller's cabin/PCR's 3. Mud pumps single/ double motor operation for testing purpose 4. Torque limiting features for rotary table drive 5. Once the auxiliaries (blower/lube-pump etc.) of Mud pumps, Drawworks drives, IRD etc. fail during running, there shall be alarm of the same in Touch screen HMI at Drillers Cabin. Additionally, alarm shall be raised at PCR's with loud sound hooter & lamp.
9.5.3.4.3.4	All necessary standard protection like Over current, DC Overvoltage, DC Under voltage, Drive Temperature, Short Circuit (motor protection), Ambient Temperature, over frequency, Internal Fault, Earth Fault, Communication Fault etc. shall be incorporated in VFD drive panels.
9.5.3.4.3.5	The inverter modules shall be interchangeable among different VFD inverter panels.
9.5.3.5	BRAKE CHOPPER PANEL Brake chopper panels shall consist of the following:
9.5.3.5.1	DC Brake Chopper with suitably rated continuous current output to match the full dynamic braking of the draw-works with sufficient overload capacity
9.5.3.5.2	Over current Alarm
9.5.3.5.3	LED indication lamp: DC bus charged; fault etc.
9.5.3.5.4	Semiconductor fuses with indicator switches
9.5.3.5.5	Resistor bank Temperature monitoring circuit
9.5.3.5.6	Resistor bank cooling fan pressure monitoring circuit
9.5.3.6	BRAKING RESISTOR BANKS: Suitably rated resistor banks shall be provided for dynamic braking. The banks shall be on the same skid as PCR, but outside the enclosure. The resistor banks shall consist of:

9.5.3.6.1	Stainless steel air cooled resistors, suitably rated for the system
9.5.3.6.2	Cooling fans (Cooling system shall be equipped with standby cooling fan. Alternatively, spare cooling fan to be provided with each Rig over & above mandatory spares)
9.5.3.6.3	Thermal limit switch
9.5.3.6.4	Pressure sensing switch
9.5.3.6.5	IP 23 MS steel resistor bank enclosure
9.5.3.6.6	IP 56 MS steel cable termination box
9.5.3.6.7	The resistor bank shall use Stainless steel Punched grid type resistors.
9.5.3.7	FEEDER PANEL - Number ONE (01) A feeder panel shall be provided to house following items:
9.5.3.7.1	TRANSFORMER FEEDER BREAKERS Transformer feeder ACB/MCCB
9.5.3.7.1.1	1000 - 1200 Amps, 600 Volts, 3-Pole, manually operated, Air Circuit Breakers/MCCBs having breaking capacity of 65 KA each for 2 X 750 KVA 600/415V 50 Hz, Delta/Star Dry Type Power Transformer for powering auxiliary AC loads and rig lighting system.
9.5.3.7.1.2	ACB/MCCBs should be settable from 0.4 x 1 of rated current with electronic release. The interrupting rating of the breakers will minimally be 65 Kilo Amperes.
9.5.3.7.2	SYNCHRONIZING SYSTEM
	Alternator synchronizing system
9.5.3.7.2.1	The synchronizing system shall feature the following minimum instruments: a) Synch. switch b) Synchroscope c) Synchronizing lamps – clear (dark lamp synchronizing) d) Voltmeters for incoming alternators and running alternators (bus) e) Frequency meters for incoming alternators and running alternators (bus). f) Phase sequence check relay. Synchronizing lamps & Synchroscope shall be placed on the left or right side walls of PCR to Generator panels (for easy visibility from all alternator control panels). Alternatively, bidder may offer their own scheme for Auto/Manual Synchronisation.

9.5.3.7.2.2	SYNC CHECK RELAY: There shall be a synch-check relay to allow alternator to be synchronized with the bus. The circuit breaker "close" signal shall be interlocked with this relay.
9.5.3.7.2.3	Other components of Synchronization system (Bus Voltmeter/ Frequency meter/Synch. Switch) shall be placed in one of the generator panel front fascia or independently.
9.5.3.7.3	GROUND FAULT DETECTION CIRCUIT (in the 600 VAC Circuit):
9.5.3.7.3.1	Ground Fault detector circuit shall mainly consist of the following: a) 600 VAC ground fault detection: Ground fault detection circuit, 3 nos. ground fault lights (for each phase), percentage AC ground fault meter b) DC ground fault detection: DC ground fault detection system (for rectifier+ DC bus/ link system) with percentage DC ground fault meter (+/0/-), test pushbutton c) 415 VAC (AC auxiliary bus)- with NGR system Alternatively, bidder may offer their own scheme for Ground Fault detection.
9.5.3.7.3.2	Audio Alarm in PCR in addition to indication at Driller's Console shall be provided for ground fault system. Ground fault circuit should be of standard design of OEM connected to each phase and to the ground through individual phase lamp (filament type). In case of AC ground fault, the phase which is grounded will have lower illumination in the lamp connected to that phase and in DC ground fault all the 3 lamps will glow brighter. Alternatively, bidder may offer their own scheme for alarm and indication with regard to Ground Fault detection.
9.5.3.7.4	POWER LIMIT CONTROL FEATURE:
9.5.3.7.4.1	The Power Limit Control shall be incorporated to monitor the KW (i.e. actual loading of engines) &'I'-Total (i.e. KVA loading of alternators) of each of the Engine-Generator sets. If the load on the system tries to exceed the rating of the engines or generators, then the power limit circuit will clamp or reduce the power drawn by the Variable frequency drives until load demand is reduced to a level below the set power limit.
9.5.3.7.4.2	The range of adjustment will allow the Power Limit to be lowered to 80% or raised to 100%. Alternatively, bidder may offer their own scheme for Power Limit.

9.5.3.7.4.3	Power limit feature shall be integral part of electronic drilling control system (software). a) Percent loading of power packs to be displayed in HMI/touch screen of Driller's cabin with warning/alarm during power limit situation. b) A warning lamp shall be illuminated on the Driller's Console when power limit is being approached.
9.5.3.7.5	HANDS-OFF CIRCUIT (HOC):
9.5.3.7.5.1	The HOC shall be designed to supply power for the engine actuator starting circuit and the pulse pick-up circuit respectively in each of the Generator Control modules.
9.5.3.7.5.2	The items to be included shall be as follows: a) Batteries & Charging system/ or UPS system b) Fuses/MCBs c) any other Control components
9.5.3.8	FEEDER BREAKER – Quantity (02) two nos. Two nos. of 600 VAC Feeder breaker for supplying power to external drives from main bus shall be provided at a convenient location in the PCR for Top drive house(if TDS Power control room is designed as separate house) & future provision e.g. Power Factor improvement device etc. The feeder breaker shall be as per following details.
9.5.3.8.1	Feeder Breaker for Top Drive House: ACB rated 1200 Amps/Suitably rated 600V AC, 3-pole, 50 Hz, 65 kA, with adjustable trip, Draw-out type. Breaker shall be manually chargeable/motorized, electrically closed and electrically tripped and with auxiliary contacts. The Feeder breaker to be furnished to be directly interchangeable with the Generator panel incomer circuit breakers. UV coil shall not be required for the Feeder breaker.
9.5.3.8.2	Feeder Breaker (Spare): ACB rated 2000Amps 600V AC, 3-pole, 50 Hz, 65 kA, with adjustable trip, Draw-out type. Breaker shall be manually chargeable, electrically closed and electrically tripped and with auxiliary contacts.
9.5.3.9	NGR SYSTEM: Restricted earth leakage protection shall be provided at 2x750 kVA transformer star connected secondary. The NGR system shall have the following features:

9.5.3.9.1	Earth fault current shall be restricted at 750 mA
9.5.3.9.2	NGR shall be provided with a Permanent Insulation Monitor (PIM) and NGR monitoring device (Bender RC48N or equivalent) with audio alarm in the PCR for monitoring NGR continuity and leakage current.
9.5.3.10	AC CONTROL PANELS/MOTOR CONTROL CENTRE: Motor control centre or MCC shall be fed from the auxiliary 415 AC bus in PCRs fed from the secondary of the main transformers (600 V/ 415 V, 3 phases, 50 Hz). Various auxiliary motor drives, PCR lighting and air-conditioning system shall be supplied from the MCC panel through switchgear. No live part shall be directly exposed; transparent insulating sheet/ barriers shall be provided. Provision for LOTO type safety system shall be incorporated in the panels.
9.5.3.10.1	MCC FEATURES:
9.5.3.10.1.1	Auxiliary 415 VAC bus system shall consist of tinned copper bus, bus chamber and cable alleys in a suitable arrangement. Panels shall be in vertical configuration.
9.5.3.10.1.2	Bus shall be accessible for maintenance. AC bus bars shall be insulated properly. A voltmeter and 'bus bar live' indicator lamp shall be provided indicating bus status.
9.5.3.10.1.3	Automatically controlled starters auxiliaries (e.g. blower motor, lube pump motor etc.) of MP/DWS/RT/TDS shall have facility of manual start / stop from panels. A selector switch Hand-Off-Auto shall be provided for these starters.
9.5.3.10.1.4	All other starters shall be operated from push button stations (PBS) mounted near the respective drive motors.
9.5.3.10.1.5	Motors of 75HP & above shall be started using a soft-starter. Each soft starter shall be provided with one spare socket.
9.5.3.10.1.6	Starter panel for motors below 75HP may be DOL Starter type.
9.5.3.10.1.7	Superchargers shall have on/off control at D'CON (both manual & auto)
9.5.3.10.1.8	Each motor panel should have the following minimum components located on the front fascia a) One overload reset button b) MCCB operating handle / lever with TRIP, ON, OFF positions marked c) LED Indication lamps (with Low Voltage Glow Protection feature) for motor ON/OFF, RUN, OVERLOAD TRIP, EARTH LEAKAGE TRIP d) Selector switch for HAND / OFF / AUTO for required starters e) One ammeter to indicate load current
9.5.3.10.1.9	All the components including MCC bus should be approachable from the front. Supplier shall study the total requirement with the space available and shall submit various options of panel arrangement for OIL's approval. Starters shall be provided with individual cubicle; however 2-4 Feeders (not starters) can be combined in one cubicle.

9.5.3.10.1.1 0	All the starters for AC motors (except Shale Shaker, Mud Cleaner, BOP, Bug blower, Degasser, Centrifuge, Air Compressor) irrespective of rating are to be housed in the MCC panel of power control room and only push button stations with On/Off controls are to be located near respective equipment. All motors and push button stations will be directly connected to the power control room through individual cables and plug sockets.
9.5.3.10.1.1 1	415V Emergency Bus: (Refer to APPENDIX-AA-IX – Typical Single Line Diagram) The power from the 250 KVA Genset shall be fed into an emergency 415V bus bar inside the PCR. To limit the load on 250 KVA Gen set, only following outgoing feeder /Motor Starter panel shall be from the 415V Emergency Bus: a) One feeder for Isolation transformer hut, b) one feeder for Air compressor, c) one number water booster Motor d) Hydraulic motor (for rig up / down), e) Hazardous area lighting (i.e. incomer of 60 KVA lighting transformer) There shall be provision for electrical isolation of the emergency bus bar from the main 415V bus bar using a withdrawable type air circuit breaker (ACB) of sufficient nominal rating, breaking/ withstand and making capacity, manually chargeable, electric closing, with solid state trip unit. There shall be an interlocking of the 250 KVA generator output ACB and the emergency busbar isolation ACB such that only one of the two operates at a time.
9.5.3.10.1.1 2	Safety Interlocking arrangement shall be in place for 415V Emergency Bus Bar system. Interlocking arrangement shall be such that when, the emergency bus bar isolation ACB shall be closed (the emergency bus shall be fed from rig alternators), 250 KVA generator output ACB must open automatically. However, when Rig Alternators are not in operation, the emergency bus bar shall be fed from the 250 KVA generator set with the 250 KVA generator outgoing ACB closed and emergency bus isolation ACB must open automatically).
9.5.3.10.2	Protection: All starters and feeders shall have individual MCCBs as incomers, except those started with the soft starters. However, for the soft starter started motor groups, there will be a single incomer MCCB per group, with sufficient current carrying capacity for simultaneous running of all motors in the group at full load.
9.5.3.10.2.1	All starters shall have at least the following protection/ features: a) Short Circuit Protection b) Overload (Thermal type) c) Contactor d) Earth leakage trip which shall cut off the power supply in case of an earth fault in that particular circuit (30 mA & 300 mA selectable)

9.5.3.10.2.2	All breakers/ MCCBs used in the MCC shall be suitable for IT system as per IEC 60947-2 / IS 13947. All breakers/MCCB used in the MCC shall be suitable for disconnection and shall have positive visual isolation. The neutral shall not be served and supply from the MCC bus shall be 3 Phase & 3 Wire. a) The MCCBs should be suitable for DOL motor starting (Induction motors) for all motors below 75HP. b) Control supply of individual starters shall be tapped from its own line; the starter shall be in-operative if the MCCB is off. c) The MCCB shall have clear ON/OFF/TRIP positions. d) The MCCB should have facility for time Delayed-Overload protection (adjustable 0~10 sec, 0.7~1.2 In), Short circuit protection (10 x In), and separate (add-on) RCD with trip setting of both 30mA and 100mA/300mA. e) Operating handle should be accessible from the exterior of the MCC cubicle, with the door shut. f) All the power cable terminations are to done with proper colour coded terminal blocks i.e. red, yellow, blue etc.
9.5.3.10.2.3	The selection of MCCB, contactors and relays for the starter panels should be as per Type 2 coordination (IS 13947 or IEC60947). All MCC panels shall be identical and all components fitted in the starter panels shall preferably be of same make.
9.5.3.10.3	Push Button Station: Starter panels shall be operated from push button stations (PBS) mounted near the respective drive motors. PBS specifications:
9.5.3.10.3.1	Remote PBS (Push Button Station) / Hand-Off-Auto feature as required
9.5.3.10.3.2	Control Circuit voltage shall not exceed 30V (As per OMR-2017, Regulation no.125(4(b))) and shall be provided with intrinsically safe barrier circuit (As per CEA(Measures relating to safety and electric supply) Regulations, 2010, Regulation no.110(3)).
9.5.3.10.3.3	Shall have earthing provisions.
9.5.3.10.3.4	Push Button Stations shall be provided, containing Emergency Stop / Lockout pushbuttons. The PBS should have facility for lockout of the motor in order to enable maintenance work to be done. All PBS should have IP66 type protection and canopies for rain shade. All PBS shall be certified for installation in Zone 1/Zone 2 Hazardous area of Oil mines, Gas groups IIA & IIB. Test reports/ Certificates confirming to the above relevant standards from an Indian government laboratory or NABL accredited laboratory or IECEx accredited laboratory or ATEX notified body, which is not a part of the manufacturer's facility shall be submitted.
9.5.3.11	PCR AIR CONDITIONING: The PCR (s) will be air conditioned and humidity controlled. The ambient air is expected to vary from 4 Deg C to 45 Deg C. The air conditioning for the PCR (s) shall be properly sized and air conditioning units located to take into account the heat generated by internal equipment in full load conditions in locations with high ambient.

9.5.3.11.1	Air conditioning system components shall preferably be located on the same skid as the PCR.
9.5.3.11.2	If the air conditioners are top mounted, then it shall be taken care that the bus bars are not exposed (visible from top) for safety purpose, once the air conditioners are dismantled during rig movement.
9.5.3.11.3	The temperature inside the PCR (s) should not exceed the recommended level for the rectifier, inverters & other semi-converter devices under any circumstances.
9.5.3.11.4	Additionally, the air conditioners shall be able to reduce the relative humidity level to recommended levels from 98% by itself.
9.5.3.11.5	The AC system should have 100% redundancy, i.e., half the capacity should be standby at all time.
9.5.3.12	PCRS INTERNAL LIGHTING: PCRs internal lighting shall be supplied from isolation transformer in case 230 VAC L-N light fittings are used with suitably rated MCCB. Individual MCBs shall be provided inside distribution board for each outgoing circuit.
9.5.3.13	INTERNAL CABLING All internal wiring of the MCC/starter panels, control wiring etc. shall be done with 1.1 KV grade fire retardant PVC insulated tinned copper multi-stranded flexible cables with proper lugs.
9.5.3.14	TYPE OF EARTHING IT system of neutral grounding with maximum ground fault current limited to 750 mA using suitable NGR as per CEA Regulations is to be used. All breakers, MCCB, MPCB shall be suitable for IT system as per IEC 947-2. The neutral shall not be served and supply from the main MCC bus shall be 3 Phase & 3 Wire. Main Transformers' output shall be provided with a Residual Current Monitor (RCM) for indication/ alarm. Scheme, Type, Make and Model of RCM shall be submitted for approval of OIL.
9.5.3.15	PLUG AND SOCKET PANELS: Suitable plug and socket arrangement shall be provided for interconnection of the PCRs, PCR with alternators, motors, auxiliary loads, remote interface modules etc. with cables. Socket compartments shall be suitable for ease of quick rig-up and rig-down operations.
9.5.3.15.1	Two (2) / Three (3) nos. plug socket compartments shall be provided for the ease of quick rig-up and rig-down operations.
9.5.3.15.2	Plugs/sockets of same make (preferably) shall be fitted in the all cables.
9.5.3.15.3	Plugs & sockets (crimped type) should be suitable to accommodate up to 300 sq mm flexible copper cable with built-up conductor diameter of 26 mm & OD of 35 mm (+/-1 mm).

9.5.3.15.4	The alternator socket board should be provided with adequate nos. of sockets/cables per phase to carry rated current of alternator continuously.
9.5.3.15.5	Drilling motor power and control cable socket board shall be towards the derrick. Generator plug panel recessed type on the side facing power packs can be provided.
9.5.3.15.6	The plug sockets cable termination shall be crimped type. Horizontal steel bars shall be provided in the compartments for supporting the layers of cables.
9.5.3.15.7	The plug / socket compartments shall be well illuminated and each plug/socket shall be suitably marked for ease of identification of circuits/ loads.
9.5.3.15.8	There should be adequate number of spare sockets of each type available in the socket board.
9.5.3.15.9	Minimum 12 set of extra plug and sockets of each type & rating shall be supplied as loose spare items by the supplier. Supplier to furnish list of plugs & sockets used and spare quantity supplied. (Note: Specific to special plugs and sockets for which the actual quantity used is less than 12, the extra plug & socket shall be same as quantity in use per rig)
9.5.3.16	TRANSFORMERS:
9.5.3.16.A	There shall be five power transformers in all inside PCR: a. Two Main Transformer (750 kVA) for MCC supply b. Two Lighting transformers (60 kVA each) for lights in hazardous areas c. One isolation transformer (30 kVA) for general lighting.
9.5.3.16.B	All the transformers shall be protected through suitably rated MCCBs in the primary and secondary sides. All live parts of the transformers not insulated shall be protected adequately. Transformers shall be placed at suitable positions, taking into consideration working space, socket board positions, equal distribution of weight of the PCR etc.
9.5.3.16.1	Main Transformer for MCC supply: Two (02) nos. main transformer, dry type, copper wound, air cooled to meet the auxiliary motor/ Air conditioner and lighting/ other load requirement as described in Para 9.5.3.20-PCR Starters/Feeders as per following broad specification:
9.5.3.16.1.1	Capacity – 2 x 750 KVA minimum, continuous rating

9.5.3.16.1.2	Voltage – 600/415 volts
9.5.3.16.1.3	Vector Group – Dyn11, star connected secondary with neutral terminal available in terminal box
9.5.3.16.1.4	Frequency – 50 Hz
9.5.3.16.1.5	Phases – 3 phase
9.5.3.16.1.6	Impedance – 5% for connection
9.5.3.16.1.7	Ambient temperature 4-47 Deg C
9.5.3.16.1.8	Insulation – Class H (or 220 Deg C)
9.5.3.16.1.9	Cooling- Air Natural cooled
9.5.3.16.1.10	Rated power freq. withstand – 3 kV (RMS) or better
9.5.3.16.1.11	Standards – Indian Standard IS: 11171 or equivalent international standard
9.5.3.16.1.12	Primary and secondary side terminations: Suitably sized flexible copper cable shall be used for all 3 phases. Stand-off copper termination (termination using copper flats) shall be provided. All cable lugs shall be terminated using removable nut and bolts.
9.5.3.16.2	LIGHTING SUPPLY TRANSFORMERS FOR HAZARDOUS AREA LIGHTING: Two (02) nos. lighting supply transformer (240 VAC Phase-to-Phase) as per the following broad specifications: (CEA (Measures relating to safety and electric supply) Regulations, 2010, Regulation no.102)
9.5.3.16.2.1	Capacity – 2x 60 KVA, continuous rating
9.5.3.16.2.2	Voltage – 415/240 volts (Phase-to-Phase)
9.5.3.16.2.3	Frequency – 50 Hz
9.5.3.16.2.4	Phases – 3 phase

9.5.3.16.2.5	Impedance – 5%
9.5.3.16.2.6	Vector Group – Dyn11, Star connected secondary, with neutral solidly earthed
9.5.3.16.2.7	Enclosure – IP23 type, with provision for natural circulation of cooling air.
9.5.3.16.2.8	Ambient temperature 4-47 Deg C
9.5.3.16.2.9	Temperature rise above ambient – 80 Deg C
9.5.3.16.2.10	Insulation – Class F
9.5.3.16.2.11	Rated power freq. withstand – 3 kV (rms) or better
9.5.3.16.2.12	Standards – Indian Standard IS: 11171 or equivalent international standard
9.5.3.16.2.13	Primary and secondary side terminations: Suitably sized 3 core copper cable shall be used. Stand-off copper termination (termination using copper flats) shall be provided. All cable lugs shall be terminated using removable nut and bolts
9.5.3.16.2.14	Secondary side of the lighting transformers (415/240 VAC, phase-to phase, supplied from the AC main 415 bus) shall be connected to the 3-phase rig lighting DB. The lighting DB rating shall be sufficient for supplying the hazardous area of rig and mast lighting. All outgoing feeders from the DB shall be 240 VAC, phase-to-phase. 2-pole RCBO of suitable capacity with 30mA sensitivity shall be provided for each circuit.
9.5.3.16.2.15	Special requirement: Provision shall be given for supplying the lighting DB from external supply, in case of failure of the lighting transformers. Accordingly, a suitably rated change over switch shall be provided in the MCC panel, in conjunction with the feeder supplying the lighting transformers.
9.5.3.16.3	ISOLATION TRANSFORMER: One (01) no. 30 KVA dry type isolation transformer with the same specification as the lighting transformers, except the following:
9.5.3.16.3.1	Capacity– 1x 30 KVA, continuous rating

9.5.3.16.3.2	Voltage – 415/415 volts, Dyn11, neutral available for connection.
9.5.3.16.3.3	The isolation transformer shall be used to supply the general rig area lighting (230V L-N for PCR internal lighting/Engine house/compressor house lighting etc.), crew camp power supply and auxiliary loads which need a 240 V phase-to-neutral connection. Neutral of the isolation transformer shall be grounded solidly.
9.5.3.16.3.4	Primary and secondary side terminations: 1. Two nos. 3 core, 35 mm2 cable for both primary and secondary sides. 2. Stand-off copper termination (termination using copper flats) shall be provided. All cable lugs shall be terminated using removable nut and bolts.
9.5.3.17	POWER FEEDERS: Apart from motor starter panels, certain other loads are also required, e.g. Welding sets, Hand tools, Effluent treatment plant, Logger house, Deviation bunk house, power tong etc. There should be individual 3 Phase feeders for such loads.
9.5.3.18	SMOKE DETECTION AND FIRE ALARM SYSTEM: Following shall be the scope of supply for the Smoke detection and fire Alarm System:
9.5.3.18.1	Smoke detector: Photoelectric or Ionized type.
9.5.3.18.2	Control Panel with Manual call Point (MCP)
9.5.3.18.3	Internal house buzzer, 80 dB at 1 m
9.5.3.18.4	External house hooter, Min 100 dB at 1 m
9.5.3.18.5	Wiring and installation accessories kit
9.5.3.18.6	Any other material required for the installation and satisfactory operation of the system.
9.5.3.18.7	There shall be two (02) detectors on front side of the panels and two (02) on the rear side of the panels at accessible locations. Smoke detectors shall preferably be mounted on the ceiling of the PCRs or at any other location inside the house.

9.5.3.18.8	Control panel along with internal house buzzer & manual call point control shall be installed near entry/exit door. External house hooter shall be installed at the outside of the house facing derrick side. All wiring inside the house should be properly dressed and routed through conduits / cable trays.
9.5.3.18.9	The PCRs shall have smoke detection and fire Alarm System as per requirement of OISD Std. No: 216 for Electrical Safety.
9.5.3.19	DRILLER'S CONTROL CABIN & MUD PUMP CONTROL CONSOLE:
9.5.3.19.1	Driller's control cabin (or D'CON) and Mud pump control console shall be integral parts of the rig control system.
9.5.3.19.2	The D'CON should consist of the following minimum controls and display functions:
9.5.3.19.2.1	HMI to enable the driller to monitor and control the entire drilling operation.
9.5.3.19.2.2	Control switches to control main drive motors (manual switches)
9.5.3.19.2.3	Indicators and meters
9.5.3.19.2.4	Speed controllers to control speed and direction of various main motors.
9.5.3.19.2.5	DW, Rotary, top drive, Mud pumps, Generator/engine parameters, VFD converter status/alarm etc.
9.5.3.19.2.6	Supercharger pumps shall be started & stopped manually from Driller's Console.
9.5.3.19.2.7	Two emergency stop buttons, one for the VFD system, and another for the Generator panel CBs /power packs (total power shutdown).
9.5.3.19.2.8	The Driller's Control cabin shall be air-conditioned, with the air conditioner being Explosion proof type, suitable for installation in hazardous areas, Zone 1 or 2 based on actual location of Driller's cabin on Rig floor as per OEM layout.
9.5.3.19.2.9	The MP Console or MPCON shall be provided for local control of mud pumps, with suitable switches, speed control and indication system. It shall also be able to communicate with the rig control system. The MPCON shall be able to control the mud pumps up to full speed. The controller to be used shall be suitable for communication with remote consoles and other rig components and devices.
9.5.3.19.2.10	The panel/enclosure housing all non-Ex type electrical components inside Driller's Control cabin shall be purged as per OMR-2017 requirement. Alternatively, the driller's cabin shall be HVAC purged (IECEX/ATEX certified HVAC purging system for zone-1 or zone 2 based on Driller's cabin location as per OEM layout). The purging system must draw fresh air from a safe area and maintain a positive pressure inside Driller's Cabin. If HVAC and purge system are built as one unit, then both shall be certified together. There shall be an alarm in case of loss of purging.

<u>9.5.3.20</u>	<u>INDICATIVE PCR STARTERS/FEEDERS</u>			
<u>9.5.3.20.A</u>	<u>Starter panels</u> The starter/ feeders shall be inclusive but not limited to the following list:			
	Sl. No	Motor Load (Indicative)	Application	Remarks
	1	100/75 HP	Desander (ULMMC)	Cable size shall match motor HP
	2	100/75 HP	Desilter (ULMMC)	
	3	100/75 HP	Mud Mix-1	
	4	100/75 HP	Mud Mix-2	
	5	100/75 HP	Super Charger-1	
	6	100/75 HP	Super Charger-2	
	7	100/75 HP	Super Charger-3	
	8	75/100 HP	Hydraulic Unit -1	
	9	75/100 HP	Hydraulic Unit -2	
	10	100 HP	Spare - 1	Cable size shall match motor HP
	11	100 HP	Spare - 2	
	12	60/75 HP	Centrifuge	
	13	30/40 HP	Water Booster Pump-1	

	14	30/40 HP	Water Booster Pump-2	
	15	20/30 HP	Trip Tank-1	
	16	20/30 HP	Trip Tank-2	
	17	10/15/20 HP	Mud Agitator -1	
	18	10/15/20 HP	Mud Agitator -2	
	19	10/15/20 HP	Mud Agitator -3	
	20	10/15/20 HP	Mud Agitator -4	
	21	10/15/20 HP	Mud Agitator -5	
	22	10/15/20 HP	Mud Agitator -6	
	23	10/15/20 HP	Mud Agitator -7	
	24	10/15/20 HP	Mud Agitator -8	
	25	10/15/20 HP	Mud Agitator -9	
	26	10/15/20 HP	Mud Agitator -10	
	27	10/15/20 HP	Mud Agitator -11	
	28	10/15/20 HP	Mud Agitator -12	
	29	10HP	Ground Water Pump-1	
	30	10HP	Ground Water Pump-2	

Cable size shall match motor HP

	31	30/40 HP	Disc brake cooling Motor	
	32	30/40 HP	Disc brake cooling Motor	
	33	10/15/20 HP	Blower-DWA	
	34	10/15/20 HP	Blower-DWB	
	35	10/15/20 HP	Blower-MP1A	
	36	10/15/20 HP	Blower-MP1B	
	37	10/15/20 HP	Blower-MP2-A	
	38	10/15/20 HP	Blower-MP2-B	
	39	10/15/20 HP	Blower-MP3A	
	40	10/15/20 HP	Blower-MP3B	
	41	3/5 HP	HP washing unit	
	42	3/5 HP	HP washing unit	
	43	3/5 HP	MP1-Liner Flushing	
	44	3/5 HP	MP2-Liner Flushing	
	45	3/5 HP	MP3-Liner Flushing	
	46	3/5HP	MP1-Mud Pump Lube	Cable size shall match motor HP
	47	3/5HP	MP2-Mud Pump Lube	

	48	3/5HP	MP3-Mud Pump Lube
	49		Top drive blower Motor -1
	50		Top drive blower Motor -2
	51		Top drive lube oil motor
	52	5/7.5 HP	Fuel Transfer Pump- 1
	53	5 /7.5 HP	Fuel Transfer Pump- 2
	54	5/7.5 HP	Chemical Mixing Tank
	55	5/3 HP	DW Lube-1
	56	5/3 HP	DW Lube-2
	57	5/3 HP	Degasser
	58	5/3 HP	Bug Blower
	59		Shale Shaker-1A
	60		Shale Shaker-1B
	61		Shale Shaker-2A
	62		Shale Shaker-2B
	63		Shale Shaker-3A
	64		Shale Shaker-3B

	65	5/7.5 HP	Fuel decanting Pump-1	
	66	5/7.5 HP	Fuel decanting Pump-2	
	67	3/5 HP	Mud Cleaner-1	Cable size shall match motor HP
	68	3/5 HP	Mud Cleaner-2	
	69	15 HP	Resistor bank-1 blower motor	
	70	15HP	Resistor bank-2 blower motor	
	71	7.5/ 10 HP	LDO tank motor	
	72	10/15 HP	Sludge tank agitator motor	
	73	10 HP	Cellar pit motor	
	74	30/40 HP	Spare – 3	
	75	30/40 HP	Spare – 4	
	76	10/15/20HP	Spare – 5	
	77	10/15/20HP	Spare – 6	
	78	10/15/20HP	Spare – 7	
	79	10/15/20HP	Spare – 8	
	80	10/15/20HP	Spare – 9	
	81	10/15/20HP	Spare – 10	

	82	15 HP	Spare – 11	
	83	10 HP	Spare – 12	
	84	5/7.5 HP	Spare – 13	
	85	3/5 HP	Spare – 14	
	86	3/5 HP	Spare – 15	Cable size shall match motor HP
	87	3/5 HP	Spare – 16	
	88	3/5 HP	Spare – 17	
	89	3/5 HP	Spare – 18	
	90	3/5 HP	Spare – 19	
9.5.3.20.B.	TENTATIVE MCC- Feeder Circuit Breakers Data			
	Sl. No.	Rating	Application	Remarks
	1	125 A	Compressor-1	Cable size shall match motor HP.
	2	125 A	Clear fluid system	
	3	425 A	(250) KVA DG Incomer	
	4	63A	Welding set	
	5	125A	VFD House AC-1	
	6	125A	VFD House AC-2	

	7	63A	DRILLER CABIN HVAC	
	8	63A	DRILLER CABIN PURGE	
	9	125 A	Area light DB 1	
	10	125 A	Area light DB 2	
	11	125 A	Lighting Transformer -1	
	12	125 A	Lighting Transformer -2	
	13	125 A	Spare	
	14	125 A	Spare	
	15	100A	BOP Feeder	
	16	250 A	Isolation transformer hut	
	17	250 A	Spare	
	18	63A	Mud logging Unit	
	19	63A	Spare	
	20	63 A	Spare	
	21	425 A	CEMENTING UNIT	
	22	425 A	Spare	

9.6	ISOLATION TRANSFORMER AND CONTROL PANEL: Oilfield type skid mounted electrical control panel with isolation transformer for supplying power to area/ boundary lights, crew houses (camp site) & hazardous area lighting shall be supplied. The system shall consist of incomers, 250A changeover switch, distribution feeders (MCBs/ switches), plugs and sockets etc., mounted on an oil-field type skid. The complete system will be designed to meet the current load demand as well as the increase in near future.
	Well-Site Area & Crew Hut Illumination Control Panel
9.6.1	Oilfield type skid mounted electrical control panel with isolation transformer for supplying power to area/ boundary lights, crew houses (camp site) & hazardous area lighting shall be supplied. The system shall consist of incomers, 250A changeover switch, distribution feeders (MCBs/ switches), plugs and sockets etc., mounted on an oil-field type skid. The complete system will be designed to meet the current load demand as well as the increase in near future. The isolation transformer cabin shall be placed outside the hazardous area of Oil fields (i.e. minimum 30 meters from the Well Centre).
9.6.2	The shed for the transformers shall be an outdoor, weatherproof, transportable steel house on a self-supporting oil field skid suitable for tail boarding from either end in balanced condition. The shed shall be suitable for either top or bottom lift. There shall be provision for lifting the skid at both ends. The limiting dimension and weight shall be as follows: Length: 4 m ; Width: 2.5 m; Height: 3 m; Weight: 15 Ton
9.6.3	The shed shall be a fabricated sheet steel (not less than twelve-gauge) structure and shall house the incomer plug socket compartment, incomer MCCBs (with built-in Over current/ short circuit and earth leakage protection), TPN bus and distribution board, outgoing Plugs-sockets, and plug socket compartments.
9.6.4	The side panels containing the incomer and outgoing feeder plug socket arrangement shall swing out for ease of connections / maintenance. Another panel/cover shall be provided outside the socket board panels for protection of the socket board panels during transportation. The outer panel shall be hinged at the top and provided with supports, so that it can also give rain protection to the plug-socket panels, when in operation. All corners of the shed are to be formed by bending, leaving no sheet edge exposed. Skid and panel shall be painted with anti-corrosive paint
9.6.5	Tinned copper Busbars shall be provided
9.6.6	Phase indication lamps shall be present
9.6.7	Voltmeter (on both incomers and outgoing), Ammeter and Frequency meter shall be fitted
	Internal shed illumination with 4' long LED type indoor industrial corrosion proof luminaries, IP-65, with clear cover, complete with MCB on/off switch mounted outside, wiring (with tinned copper cable, suitably glanded to fitting) at a suitable place
9.6.8	Internal wiring/cabling- Cables shall be of suitable size, 4 core, tinned copper, screened, FRLS PVC/Elastomer insulated, sheathed and of reputed make

9.6.9	Plug-sockets (fitted)
9.6.10	Incomer MCCBs and outgoing RCBO / RCDs
9.6.11	Provision for double earthing of the skid
9.6.12	Isolation transformer is to be provided with following rating: 100 KVA, dry type, 415 or 400V/230V, 3 phase, 50 Hz with double earthing
9.6.13	Provision for power supply shall be provided from PCR as well as an alternate source using a changeover switch. Incomer power shall be fed through MCCB of suitable rating
9.6.14	Outgoing MCCB of transformer should have tripping provision with earth leakage sensitivity of 100 mA. This MCCB should be installed on Well site Area & crew Hut power control panel.
9.6.15	The output from both transformers shall be fed to the distribution system on well site area control panel through above MCCB.
9.6.16	The rating of Incomer plug & receptacle shall be as follows: 250 A, 5 Pin incomer plug & receptacles: 02 nos. (Incomer for isolation transformer from PCR and spare) 250 A changeover switch with a provision for alternate source (other than PCR)
9.6.17	The rating of Outgoing plug & receptacles shall be as follows: 63 A, 5 pin outgoing feeder plug and socket: 05 nos. 32 A, 5 pin outgoing feeder plug and socket: 10 nos. 16 A, 5 pin outgoing feeder plug and socket: 12 nos.
9.7.1	CABLE HANDLING SYSTEM: Cable Handling System / Cable Trays / Cable Boxes
9.7.1	Grasshopper cable rack suitable for elevating with derrick floor shall be used for leading and supporting draw work and top drive cables including control, lighting, and auxiliary motor cables
9.7.2	Grass hopper shall have sufficient cable storage area for coiling cable lying beyond cable extender towards derrick floor, during rig movement.
9.7.3	The rig package shall be supplied with a cable extender equipped with provision for coiling additional cable required for drilling clustered location. Coiling additional cable in the cable tray shall not be permissible. Bidder to submit the design strategy of the extender.
9.7.4	No cable will be allowed to be laid on ground outside cable tray/ rack. The cable trays shall have sufficient room for all the laid cable and the tray cover shall not touch the top layer of the cable so as to avoid any damage to the cables

9.7.5	For mud/water tank cables, foldable type cable hangers should be mounted on mud/ water tank walls, to support the mud system cables. Suggested spacing between hangers is 1000 mm, width of the hangers is 300 mm.
9.7.6	The cable trays shall have the following specifications: The material of all the supporting structures for the cable trays shall confirm to IS: 2062-1992 Shaker / Chequered plate of thickness 5 mm (minimum) with stiffeners shall be used as Top cover Separate arrangement be present to lay control cables, PROFIBUS cable, and optical fibre cables. Two numbers of earthing stud must be provided for each cable support structure. Earthing leads of steel wire with lugs are to be provided for interconnection between two Cable support stands
9.7.7	Steel cable boxes, skid mounted, for cable storage during rig movement shall be provided. Cable boxes shall be designed for in-line arrangement. Suitable locking arrangements shall be provided with the cable boxes.
9.7.8	The number of cable trays and cable box shall be as follows: Short Tray – 1m (L) x 1m (B) x 0.8m (H) - 20 nos. Long Tray – 5m (L) x 1m (B) x 0.8m (H) - 20 nos. Cable box – 5m (L) x 1m (B) x 1m (H) - 3 nos.
9.8	RIG EARTHING SYSTEM
9.8.1	Complete rig earthing system shall be supplied, consisting of G.I. earth electrodes, clamps and suitable size G.I. straps to connect all generators, motors, junction boxes, light fittings, mud tanks, mud pumps, sub structure, water/ fuel tanks, crew houses, lighting poles and the main PCR (s) to the earth.
9.8.2	Earth electrodes shall be of 2000 mm length, each of 50 mm OD heavy duty steel tube with galvanization. Electrodes shall have holes drilled in the body. MS plates with holes shall be welded on the top for connection of earth strips.
9.8.3	The Rig mast shall be fitted with Lightning Arrester rod for protection against lightning strikes with two (02) insulated earth conductors & two (02) separate Earth electrodes. Frames of all electrical equipment including motors, alternators, junction boxes, light fittings, push button stations, light fitting mounting poles etc. shall be connected to earth using two (2) numbers separate and distinct suitably sized earth conductors as per CEA regulation which in turn shall be connected to the main earth grid. The whole earthing should be in accordance with IS: 3043.
9.8.4	The Earthing scheme along with the electrode layout should be submitted along with the bid for approval.
9.9	<u>250 KVA AUXILLARY GENSET</u>
9.9.1	Alternator specification for auxiliary generator set:

	Alternator for standby engine- generator set specification
9.9.1.1	Rated voltage: 415VAC
9.9.1.2	Capacity: 250 KVA
9.9.1.3	Power factor: 0.8 lagging
9.9.1.4	Phases: Three phase, three wire star connected with neutral grounded through NGR (refer 9.9.2.13)
9.9.1.5	Frequency: 50 Hz
9.9.1.6	Frame Size & RPM: Compatible with the engine (Refer to engine section 5).
9.9.1.7	Insulation Class: H
9.9.1.8	Enclosure: Alternator- IP 23 minimum; Terminal box- 44 minimum
9.9.1.9	Voltage regulation: $\pm 5\%$ (As per IS 13364-2)
9.9.1.10	Frequency regulation: $\pm 3\%$ (As per IS 13364-2)
9.9.1.11	Alternator waveform shall be as per IEC60034-1.
9.9.1.12	The alternator shall be able to withstand the shock and vibration associated with the frequent relocation of drilling rigs, as also to withstand severe environmental conditions including heat and high humidity. Rotors should be dynamically balanced and engineered to withstand 125% over nominal speed.
9.9.1.13	Rotor and stator shall be VPI and dried
9.9.1.14	Stator leads shall be terminated on suitably rated copper straps (standoff connectors) for connection to load side
9.9.1.15	Plate for main cable entry should be of non-magnetic materials to avoid heating by generation of eddy currents, as single core power cable will be used for termination (Size of the cable shall be mentioned by bidder)

9.9.1.16	Insulation barrier should be provided to separate power and control terminals
9.9.1.17	Two nos. eye bolts for lifting the alternator should be provided on the main frame
9.9.1.18	Cable glands shall be provided for safe and proper entry of all cables
9.9.1.19	All the terminals shall be labelled properly
9.9.1.20	The rating plate of the alternator shall be as per IS/IEC 13364-2
9.9.1.21	The alternator shall be fitted with six (06) RTDs
9.9.2	<u>GENERATOR CONTROL PANEL AND CONTROL STRATEGY</u>
9.9.2.1	Generator control unit (package) for operation, control, metering and protection of Alternator/ Engine
9.9.2.2	The alternator control panel shall be placed inside the auxiliary generator set enclosure (not inside the PCR)
9.9.2.3	The alternator output shall be delivered to a socket board on the genset enclosure through MCCB/ ACB, of sufficient nominal rating, breaking/ withstand and making capacity, manually chargeable, electric closing, with solid state trip unit.
9.9.2.4	The load of the standby alternator shall be limited strictly to: a. Rig light (including mast light, area light) b. One air compressor c. Hydraulic motor (for Mast up/ Mast down) d. One water booster motor e. Crew house/ engineer office lights, air conditioners (including driller's cabin AC)
9.9.2.5	The socket board mentioned in 9.9.2.3 shall have the following outgoing plug & receptacle -

	425 Amps (minimum): 2 nos. (for PCR incomer & one spare) 250 Amps: 1 no (for direct connection to isolation transformer) 125 Amps: 2 nos. (for direct connection to compressor/ hydraulic motor/ water booster motor & one spare)
9.9.2.6	The bidder shall provide suitably rated cables along with matching Plug and socket (at both end of the cable) for supplying power from 250 KVA socket board to following. a. PCR b. Isolation transformer Hut (For Rig Lighting) c. Hydraulic Motors for Mast Up / Mast Down/ one air compressor/ one water booster (length of this cable shall be minimum 100 metres). The cables used for above shall conform to specification mentioned in clause: 10.3.1 (Cables)
9.9.2.7	The alternator shall have protection against: a. Over voltage b. Over current c. Over frequency d. Under frequency
9.9.2.8	LED Indication lamps (with Low Voltage Glow Protection) -Gen. RUN, Gen. ON-LINE, Gen. FAULT etc shall be placed on generator panel. The indication lamp shall be same as the ones on the generator control panel inside the PCR
9.9.2.9	Control Transformers, fuses, links, terminal blocks etc. (if any) shall be placed inside the alternator control panel
9.9.2.10	Any other Electronic control system may be placed inside the alternator control panel

9.9.2.11	Analog meter shall be provided on the generator control panel to display Phase Volt, Phase current, Kilowatt, KVAR, Actuator Current, Exciter Current. A digital energy meter and RTD temperature metre shall be provided. The metres shall be same as the one on the generator control panel inside the PCR
9.9.2.12	There shall be a cooling fan fitted on the alternator control panel for proper cooling of components inside the panel.
9.9.2.13	The alternator shall be fitted with a NGR to limit the earth fault current to 750 mA. A NGR monitor shall mounted on the panel. The NGR shall be exactly similar as that placed inside the VFD PCR. For detail specification of NGR System, refer to Section: 9.5.3.9.
9.9.2.14	The power from the 250 KVA genset shall be fed into an emergency 415 V bus bar inside the PCR.
9.9.2.15	Safety interlocking system shall be in place for 415 V Emergency Bus Bar System. Interlocking arrangement shall be such that when, the emergency bus bar isolation ACB shall be closed (the emergency bus shall be fed from rig alternators), 250 KVA generator output ACB must open automatically. However, when Rig Alternators are not in operation, the emergency bus bar shall be fed from the 250 KVA generator set with the 250 KVA generator outgoing ACB closed and emergency bus isolation ACB must open automatically).
9.9.2.16	Bidders may however submit their own scheme for distribution of power from 250 KVA generator set to the mentioned loads with proper safety interlock system considering operational convenience as well as safety of the system.
9.9.3	REPORT OF STANDARD TESTS FOR THE ALTERNATORS:
9.9.3.1	Reports of standard tests performed on the offered alternators (in accordance with IEEE std. 115, NEMA MG-1, MIL std. 705, relevant IS/IEC standards) shall be attached with the technical bid as well as and also with the supply of the materials.
9.9.3.2	(Clause deleted in the amendment)
9.9.3.3	In case the bidder is unable to provide the test reports/ certificates at the time of bid submission, then the Bidder has to categorically confirm in their offer that "Test reports/ certificates will be submitted along with the supply of materials"

9.10	GENERAL POINTS
9.10.1	BROAD OUTLINE
9.10.1.1	Though a broad outline on the requirement has been made, yet the scope should include anything not mentioned but required for completeness of the system to meet the requirement of oil well deep drilling rig (rig capacity being 2000 HP) and make the same suitable for dismantling, transportation and installation very often in rough and tough conditions
9.10.1.2	The system offered should have proven performance record. All relevant safety systems are to be incorporated and safety codes, relevant international codes to be strictly followed. Systems to be designed & manufactured to the latest NEC, IEC, IEEE-45, API 505, NEMA and BIS standards & shall meet all present accepted international standards for the product/ application. In no case safety shall be compromised. Notwithstanding the conformity of the electrical equipment to the standards as mentioned above in paragraph, the following Rules shall be taken as final and absolute standard as applicable in India. Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations, 2010 with latest amendments & Oil Mines Regulations, 2017 with latest amendments
9.10.1.3	The system shall be new, unused and complete in all respect, free from any defect arising from faulty material, workmanship or design. Any such defects, including replacement of faulty components, shall be carried out by the manufacturer free of cost during warranty period within a specified time. The OEM shall have the total & final responsibility for the design and performance of all equipment.
9.10.1.4	All components, modules, subsystems shall be of current generation with latest technology which must be in production and must not face obsolescence in near future.
9.10.1.5	The controls i.e. all electronics including modules and different electronic components, controllers etc. shall have high levels of noise immunity. They shall have high level of EMC and shall be immune from noise generated by A.C. variable frequency Drives
9.10.1.6	The system including all sub-assemblies, panels and components should be designed to facilitate backward integration of future modules, cards etc.
9.10.1.7	Provide all manufacturer test reports/ certificates for all meters installed in all PCRs
9.10.1.8	All labelling/ markings/ signage used in the rig, drawing, service manual or any other document shall be in English (USA or UK) language only.
9.10.1.9	Test reports/ Certificates confirming to the relevant standards from an Indian government laboratory or NABL accredited laboratory or IECEx accredited laboratory or ATEX notified body, which is not a part of the manufacturer's facility shall be submitted along with the bid and also with the supply of the materials for all such equipment which are used in Zone-1 or Zone-2; or hazardous area (within 30m from well centre). In case the bidder is unable to provide the test reports/certificates at the time of bid submission, then the bidder has to categorically confirm in their offer that "Test reports/certificates will be submitted along with the supply of materials".

9.10.2	SPECIAL REQUIREMENTS
9.10.2.1	The use of electrical apparatus either in Zone-1 or Zone-2 or hazardous area [within 30 Mtrs. from well centre as per OMR 2017(Regulation no.96(3))] of the mines shall comply with the provisions of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010) and all such equipment shall be explosion proof type as per IS/IEC 60079 standard. Explosion proof light fittings, all ac motors including VFD drilling motors (explosion proof), PBS and any other equipment should conform to the relevant standards.
9.10.2.2	VFD drives for Draw works, Mud pump, Rotary drive, Top drive shall be same and inter-changeable.
9.10.2.3	Supplier shall provide the maintenance schedule of all the equipment at the time of supply.
9.10.2.4	If any motor/ generator is greasable, the OEM recommended grease shall be supplied so that the equipment can be greased for at-least one (01) year from the date of supply.
9.10.2.5	Induced voltage on all plugs and receptacles for VFD motors shall be grounded adequately.
9.10.2.6	All electrical equipment not suitable for hazardous area, e.g., Power Control Rooms (PCR), Power Packs etc. shall be placed at least 30 metres away from well head. Bidder to furnish rig layout drawing indicating dimensions (as per OMR, 2017).
9.10.3	SERVICE MANUALS & AS BUILT DRAWINGS Operation and Maintenance manuals of PCRs, generators, AC drive motors, auxiliary AC motors, components of panels, light fittings, rig control system etc. Drawings should be user-friendly. As far as possible "starting and ending of a control signal" should be accommodated on a single page
	Three (03) sets of all the drawing shall be provided with each rig
9.10.3.1	Spare part manual along with PCR manufacturer's part number and Component manufacturer's part no. shall be submitted
9.10.3.2	Equipment outline drawings
9.10.3.3	Single line drawings
9.10.3.4	Detailed VFD, Generator & Control Schematics
9.10.3.5	Detailed control system Schematics(Electrical)
9.10.3.6	Interconnection drawings

9.10.3.7	Plug panel drawings
9.10.3.8	Driller Cabin & other loose supply items drawings (electrical part)
9.10.3.9	Bill of material of all the items & assemblies supplied
9.10.3.10	Wiring list / drawings
9.10.3.11	Dismantling and Assembly drawings
9.10.3.12	Component Assembly diagram for each Panel showing locations of each component should be provided for PCR, Drillers' Cabin , Compressor Panel, and any other electrical panel etc
9.10.3.13	Rig Earthing Schematic
9.10.3.14	Cable schedule
9.10.3.15	Details of all electrical equipment used in the rig, including Generators, motors, cables, light fittings, push button stations, plug & sockets, junction boxes, starters etc. used in the rig
9.10.3.16	In case of the successful bidder, OIL shall study the drawings and incorporate modifications/ corrections if required. The bidder shall incorporate the modifications in the drawings and submit the same to OIL for approval. Only after getting due approval of drawings from OIL, the bidder/ manufacturer shall proceed for manufacturing/ integration of the electrical system
9.10.3.17	Commissioned and final corrected set of complete drawings. (Three (03) sets of hard copies and Two (02) sets of soft copy is to be provided in USB Pen Drive for each rig/ CD-ROM)
9.10.3.18	Commissioned and final corrected "As built" Bill of Materials (BOM)
9.10.3.19	Service manual of all equipment including air conditioners
9.10.3.20	All drawings, service manual or any other document submitted to OIL shall be in English (USA or UK) language only
9.10.3.21	Note: Bidder shall submit the following documents along with offer pertaining to Electrical system of Rigs. 1) Single line diagram of Rig 2) Equipment outline drawings/Tentative Rig layout with indicative placement of rig equipment 3) General arrangement diagrams of Power Control Rooms with panel layout 4) Datasheet/Technical catalogue/Dimensional drawings of major electrical equipment, components (AC Drilling motor, AC Induction

	Motors, Rig Alternators, VFD system, PCR panel components, Cable trays, Cable extender house, Rig Control system, Drillers cabin, Rig Lighting system etc.) 5) Filled up "ELECTRICAL ANNEXURE (CHECK LIST FOR BIDDERS)- ANNEXURE-AA1" 6) Any other documents mentioned elsewhere in the tender
9.10.4	ELECTRICIAN'S TOOLS, INSTRUMENTS, SPECIAL TOOLS, COMPUTERS FOR THE RIG SYSTEM: Tool kit should comprise of one (01) each of following instruments /tools:
9.10.4.1	Digital multi-meter; Make: Fluke/Megger/Kyoritsu
9.10.4.2	Digital clamp-meter; Make: Fluke/Megger/Kyoritsu
9.10.4.3	Digital Insulation Tester; Make: AVO/Megger / Fluke / Kyoritsu
9.10.4.4	Earth resistance tester: Make AVO/Megger / Fluke
9.10.4.5	Phase rotation meter
9.10.4.6	Analog multi-meter
9.10.4.7	Combined temperature and humidity meter, make: Fluke/Megger/Kyoritsu
9.10.4.8	Vibration meter, make: Fluke / Entek/ Megger
9.10.4.9	Sound level (db) metre
9.10.4.10	Hand held thermal camera/imager Make: Megger/ Flir/ Fluke
9.10.4.11	Tacho-metre (Non-contact type)
9.10.4.12	Ex. certified torch light
9.10.4.13	Side cutting pliers with cable stripper
9.10.4.14	Socket Set (22 sockets + 5 accessories)

9.10.4.15	Open ended spanner from 10 mm to 42 mm
9.10.4.16	Ring ended spanner from 10 mm to 42 mm
9.10.4.17	Sparkless / Non-Sparking tools for ensuring operator safety when working in hazardous zones (1 set per rig)
9.10.4.18	Chain pulley with frame- 01 no
9.10.4.19	Allen key set 1.5 mm to 10 mm (9-piece set): 2 set per rig
9.10.4.20	Wire stripper (0.5 sq.mm to 6 sq.mm cable/wire)
9.10.4.21	Pipe wrench (14 inch & 20 inch)
9.10.4.22	Insulated tools for electrical safety (1 set)
9.10.4.23	Ball pin hammer with suitable handle (600 gram)
9.10.4.24	Ball pin hammer with suitable handle (5 lbs)
9.10.4.25	Cable Height Meter; Make: Fluke/Megger
9.10.4.26	Lux meter range- 0-250 Lux
9.10.4.27	Soldering Iron 5W, 240VAC & De-soldering tool (Vacuum pump type)
9.10.4.28	Screw Driver set
9.10.4.29	Combination Pliers- 2 sizes, 6", 8"
9.10.4.30	Additional tools required to dismantle inverter and diode unit
9.10.4.31	"Mekaster" / Equivalent tool set for foundation bolts of Generators and AC main drilling motors

9.10.4.32	Hand Crimping tool (0.5sqmm – 16sqmm cables/ Wire)
9.10.4.33	Crimping tool kit for 20 pin plug & socket
9.10.4.34	Portable Hand Drill (up to drill bit size 1.5 mm to 20 mm)
9.10.4.35	Industrial duty vacuum cleaner in SS body
9.10.4.36	Hydraulic Crimping Tool for Generator and AC motor
9.10.4.37	Torque wrench
9.10.4.38	Dual channel Oscilloscope with programmable screen
9.10.4.39	Secondary injection test kit for Generator/Top Drive/Transformer feeder breakers
9.10.4.40	Laptop computer with latest configuration for control system programming. Laptop shall be loaded with the Software/ Programme / Control logic used in the Electrical system of Rig package. To be specified by bidder
9.10.4.41	Multi-function colour printer (with fax/ copy/scan) suitable for A3, A4, legal size paper
9.10.4.42	Software for control for control system with licence
9.10.4.43	Desktop computer with latest configuration. Desktop shall be loaded with the Software/ Programme / Control logic used in the Electrical system of Rig package.- bidder to provide details
9.10.4.44	CD- Driver (to read any CD-ROM provided with the rig package)
9.10.4.45	Crimping tool: 16sqmm to maximum size of cables provided by the bidder excluding cables for Alternators and Drilling Motors
9.10.4.46	Cable cutting tool for generator/ VFD motor cables.
9.10.4.47	Dehumidifier – 3 nos. per rig

9.10.5	SPARES: <u>Commissioning spares:</u> It is the responsibility of the supplier to provide adequate commissioning spares and consumables required during commissioning. 1. <u>Mandatory spares:</u> The mandatory spares supplied shall be inclusive of but not limited to the list mentioned below:		
9.10.5.1	<u>EQUIPMENT</u> The following equipment shall be supplied with each VFD rig:		
	Equipment	Used in	Qty.
9.10.5.1.1	DW/ MP/IRD AC Drilling motor	DWS/MP/IRD	Note: Quantity as per Appendix – AA -VI
9.10.5.1.2	Blower unit (for drilling motor)	AC drilling motors	
9.10.5.1.3	Soft starter	PCR starter panels	
9.10.5.1.4	Air Conditioner, Ex type	Driller's Cabin	
9.10.5.1.5	Split Air Conditioner, Ex type	Dog House/ Tool Room (if applicable)	
9.10.5.1.6	100/75 HP (3 Ph.) FLP Motor (if used in the rig package)	Super charger, mud mix, de-sander, de-silter etc.	
9.10.5.1.7	Mud agitator / water agitator motor	Mud tank/ Water tank	
9.10.5.1.8	Lube oil motors (if used)	Mud Pump / Draw Works	
9.10.5.1.9	40/30 HP motor	Water booster	
9.10.5.1.10	Blower motor assembly for resistor bank	Resistor bank	
9.10.5.2	<u>DEVICES & CONSUMABLES</u> The following devices & consumables (if used in offered rig as component) shall be supplied with each VFD rig		

	Spare item	Used in	Qty.
9.10.5.2.1	Rotating rectifier assembly of each type	Generator of power pack	Note: Quantity as per Appendix – AA -VI
9.10.5.2.2	Exciter unit of each type	Generator of power pack	
9.10.5.2.3	Diodes of rotating rectifier (3 fwd. + 3 rvs.) of each type	Generator of power pack	
9.10.5.2.4	Movistor of each type	Generator of power pack	
9.10.5.2.5	Control fuses of each type / rating	PCR, Drillers cabin, MP console	
9.10.5.2.6	Fuse holder set of each type (base and carrier)	PCR	
9.10.5.2.7	Control switches of each type	PCR, Drillers cabin, MP console	
9.10.5.2.8	Indicating meters of each type	PCR, Drillers cabin, MP console	
9.10.5.2.9	Control pots of each type	PCR, Drillers cabin, MP console	
9.10.5.2.10	Control relays of each type	PCR, Drillers cabin, MP console	
9.10.5.2.11	Contactors of each type	PCR, Drillers cabin, MP console	
9.10.5.2.12	Diodes for rectifier section	PCR	
9.10.5.2.13	Power fuse and control fuse for diodes (rectifier section) of each type/rating	PCR	
9.10.5.2.14	DC link components (if applicable)	PCR	

9.10.5.2.15	Critical spare for rectifier unit (PCB of each type (if any), HMI)	Rectifier panel	
9.10.5.2.16	Critical spare for Inverter/ VFD unit module (PCB of each type, HMI)	Inverter Panel	
9.10.5.2.17	Power and control fuse for VFD inverter unit of each type/rating	PCR	
9.10.5.2.18	Air circuit breaker/MCCB of each type	PCR – generator/ rectifier/ inverter/transf ormer panels	
9.10.5.2.19	Control / relay module for air circuit breaker of each type	PCR- generator/rect ifier/ inverter/ transformer panels	
9.10.5.2.20	Generator Panel spares (PCB of each type, Fuse of each type)	Generator panel	
9.10.5.2.21	Generator control module	Generator panel	
9.10.5.2.22	PCB of each type for MPcon/ D'con/ Ground fault/ synchronizing panel/ NGR system	MPcon/ D'con/ Ground fault/ synchronizing panel / NGR system	
9.10.5.2.23	Control/ regulating transformer of each type	PCR- generator/ rectifier/ inverter/transf ormer / MPcon/ D'con/ Ground fault	

9.10.5.2.24	MCCB for AC motor starters of each Type	PCR starter/ feeder Panels	
9.10.5.2.25	Contactors for AC motors of each Type	PCR starter/ feeder Panels	
9.10.5.2.26	Overload relays of each type	PCR starter/ feeder Panels	
9.10.5.2.27	RCD of each type	PCR starter/ feeder Panels	
9.10.5.2.28	Indication lamps of each type and colour	PCR , D'con, MPcon	
9.10.5.2.29	HMI screen for generator panel	Generator panel	
9.10.5.2.30	HMI screen for monitoring	PCR	
9.10.5.2.31	Selector switch of each type	Generator panel/ MP consol etc.	
9.10.5.2.32	Components of synchronizing system	Synchronizing panel	
9.10.5.2.33	Electrical components of drillers cabin (PCB of each type, Switch of each type, Joystick, potentiometer etc)	Drillers cabin	
9.10.5.2.34	Soft starter of each type	PCR	
9.10.5.2.35	Light fittings of each type	Area illumination	
9.10.5.2.36	Bulbs/ tubes of each type	Area illumination	
9.10.5.2.37	Plug and receptacle set of each type	PCR, PCR, D'con, MPcon, socket board of 250 KVA genset and isolation & lighting transformer	

		hut.	
9.10.5.2.38	PBS unit	AC motors	
9.10.5.2.39	Emergency lamp	PCR	
9.10.5.2.40	PCR anti panic lock set	PCR	
9.10.5.2.41	Controller/ AVR for standby generator	Standby genset panel	
9.10.5.2.42	Control transformer (if applicable) for standby generator	Standby genset panel	
9.10.5.2.43	Control and power fuse of each type for standby generator	Standby genset panel	
9.10.5.2.44	ACB for standby generator incomer	PCR	
9.10.5.3	COMMON SPARES FOR THE FIVE (05) NUMBER OF VFD RIG: The following spares shall be supplied commonly for all the five (05) VFD rigs:		
	Equipment	Used in	Qty.
9.10.5.3.1	VFD Inverter module	VFD panel	COMMON MANDATORY SPARES FOR FIVE RIGS: Quantity as per Appendix – AA -VI
9.10.5.3.2	Alternator (600 VAC mentioned in section 9.2.1)	Power Pack	
9.10.5.3.3	Alternator (415 VAC mentioned in section 9.9.1)	Standby Power Pack	
9.10.5.3.4	Power transformer (600/415 VAC)	PCR	
9.10.5.3.5	PLC/ SBC/PAC system spares	Control Panel in PCR	
9.10.5.3.6	AC of each type for PCRs	PCR	

9.10.5.3.7	Special maintenance tools for the drilling motors (as recommended by motor OEM)	VFD drilling motor	
9.10.5.3.8	Top Drive AC VFD Motor	Top Drive	
9.10.5.3.9	Top Drive Blower Motor	Top Drive	
9.10.5.3.10	Top Drive Hydraulic Motor	Top Drive	
9.10.5.3.11	Top Drive Cables (From PCR to TOP Drive Unit)	Top Drive	
9.10.6	INSPECTION OF EQUIPMENT BY OIL INDIA LIMITED Bidder shall agree to stage-wise inspection as per following schedule, of the major electrical equipment, as well as the complete rig package by OIL personnel, at various stages of manufacture, before dispatch. The Inspection cum Acceptance process would include the following minimum steps/tasks, (valid for that stage of manufacture / integration)		
9.10.6.1	Physical verification/inspection of all the items/fittings/accessories including all Parts Catalogue, Maintenance & Service Manuals, Schematics.		
9.10.6.2	Operational / functionality testing of each & every system under load (if applicable) / no load. Performance parameters shall match quoted specifications.		
9.10.6.3	Supplier shall have to take note of any modification/s for operational requirement suggested by the inspection team and comply with the same at no extra cost.		
9.10.6.4	Supplier shall confirm in writing compliance of all the points raised in the minutes of inspection as well as any other subsequent additions/changes, felt necessary.		
9.10.6.5	Supplier to inform 60 days in advance for inspection of the major electrical equipment as well as the complete rig package.		
9.10.6.6	Supplier will affect dispatch of the unit only on receipt of OIL's dispatch advice.		

9.10.7	THE INSPECTION STRATEGY SHALL BE AS FOLLOWS		
	Activity- >	Intermediate Assembly of individual equipment, before FAT, at manufacturer's works	Complete, integrated rig package, at suitable location, before dispatch for string and load test
9.10.7.1	PCRs	√	√
9.10.7.2	Power Packs	-	√
9.10.7.3	Auxiliary systems- Lighting, earthing, crew cabin, cables etc.	-	√
9.10.7.4	Complete Rig Package	-	√
FAT – Field Acceptance tests / Manufacturers standard acceptance procedures, valid for that stage of manufacture.			
9.10.8	Installation and commissioning of Electrical Equipment:		
9.10.8.1	Installation, wiring and laying out of equipment	On arrival of equipment and materials at OIL's premises the bidder shall carry out inspection of the supplied items to ascertain and certify that there is no transit damage and items are complete in all respect and hence ready for commissioning and installation. In case of any discrepancy, bidder shall take all necessary action for immediate replacement/ replenishment of the same before installation. After receipt, the equipment shall be installed at site. This will include wiring/ cabling, fitting of plugs & receptacles and any other pre-requisite activity for commissioning. Any third-party device/ equipment (if any) shall be installed at this stage.	
9.10.8.2	Initial commissioning after start up connection	This activity shall cover electrical insulation checking, wiring checking, phasing up of individual equipment and the system as a whole. After start up connection and powering up, the complete system shall be tested at no load and minimum/low load at OIL's well site. All	

		equipment as well as the whole system shall work exactly as intended. Any modification/ rewiring etc shall be carried out at this stage
9.10.8.3	Final commissioning	The electrical equipment shall be integrated with other equipment of the drilling rig and operated in conjunction with these equipment, as a complete system. Any problem/ abnormality/ defect noticed/ encountered/ logged during this stage (at full/ rated load) shall be rectified by the bidder. This shall cover adjustment of settings/ parameters, calibration of limits etc in control system/ drives etc. All electrical equipment as well as the integrated system shall function as intended.
9.10.9	Scope of Work for Annual Maintenance Contract for Electrical System of 2000 HP VFD Drilling Rigs: Refer Section 11.9.5	
9.10.10	TRAINING FOR ELECTRICAL: Please refer Section 14	

	SECTION-10 : RIG INSTRUMENTATION
10.1	RIG INSTRUMENTATION SYSTEM: Introduction: The Rig Instrumentation system envisaged shall include, but not limited to all the items as per the specifications provided such that the offered system is functionally and operationally complete in all respect. The scope of the Instrumentation system includes supply, installation and commissioning of SCADA compatible Advanced Drilling Instrumentation System for On-land Rigs.
10.1.1	SCOPE OF SUPPLY: The scope of supply includes but not limited to the following: - SCADA compatible Rig Instrumentation System. The scope shall include supply of complete system but not limited to supply of Drilling rig field sensors, Data acquisition and processing Hardware, Data server/storage system, HMI Display panel at Driller's cabin, Workstation at DIC/MIC bunk house, A3 size colour printer along with licensed softwares with lifetime validity. The scope shall also include providing access (like passwords) at all levels of all the systems. - Data Acquisition system shall be accommodated inside a Bunk House and equipped with Two (2) Nos. of 1.5 T air conditioners (split type) having minimum dimension of 12 ft. (L) X 8 ft. (W) with provision for keeping the accessories like cable and field instruments. The bunk must be equipped with table, storage locker and chairs. Proper earthing to be provided along with cable entry to be on the side with rain protection cover. - Supply of proper rated UPS for the system and the same shall be housed preferably along with Data Acquisition system in the Bunk House. - Supply of separate metal box for safe transportation of sensors and cables
10.1.2	DRILLING PARAMETERS System shall be capable of displaying and storage of all drilling parameters which shall include all but not limited to the following.

	i. Hook Load ii. Weight on Bit iii. Stand Pipe Pressure iv. Casing Pipe Pressure v. Tong Line Pull vi. ROP vii. Ton Mile viii. Rotary RPM ix. Rotary torque x. Pump SPM(Pump1/Pump2/Pump3) xi. Total SPM (Pump1+Pump2+Pump3) xii. Pump Storks (Pump1/Pump2/Pump3) xiii. Total Stroke (Cumulative) xiv. Hole Depth xv. Bit Position xvi. Tank Volume (all available mud tanks) xvii. Active Tank Volume - xviii. Total tank volume xix. Loss/Gain Volume xx. Trip Tank Volume xxi. Loss/Gain Trip Tank Volume xxii. Return Flow - xxiii. Mud Density In xxiv. Mud Density OUT xxv. Mud Temperature In/Out xxvi. Mud conductivity In - xxvii. Mud conductivity Out
10.1.3	HMI DISPLAY PANEL/WORKSTATION a) HMI display panel or workstation shall be supplied inside the Driller's cabin. This panel shall be compatible to display all the drilling parameter on the screens available. All settings, configuration, calibration, set point adjustment, alarm set points etc. shall be able to do from this unit. b) HMI display panel of driller's cabin shall be Class 1, Zone 1 certified. c) One more Workstation/ HMI display Panel with printer shall be provided at DIC/MIC bunk house for viewing of all the drilling parameters. All settings, configuration, calibration, set point adjustment, alarm set points etc. shall be able to do from this workstation of DIC/MIC bunk house too.

	One A3 size Laser colour Printer for printing Drilling graphical trend shall be supplied and to be placed in DIC/MIC bunk house. The printer which is available in the Indian market shall be provided so that cartridge can be purchased easily. Printer consumables (Cartridge and papers) shall be provided during commissioning.
10.1.4	DATA STORAGE SYSTEM - All well data, real time and historical shall be stored in the server. Provision shall be given to view historical well data in the graphical format. - Industrial type, rugged, reliable and high performance Server of reputed make with minimum configuration dual processor, 16GB RAM, 17" LCD Monitor, 1 TB HDD (02 Nos.), FDD, DVD +/- RW (Re- Write), LAN card and Internal Modem are to be provided. Licensed Windows based operating software, Antivirus Software and Drilling Application software shall also be provided along with the server. The server shall be delivered ready to run, installed with well tested software of OEM. - The server must have 5 years onsite OEM warranty with remote diagnosis. - Hot redundancy of data storage shall be ensured. - Data storage could be removed to take stored data to base office. - In case of one of the data drive is taken out, the redundant data storage system should automatically become online and store data.
10.1.5	CABLES - All the Instrumentation signal cables used shall be shielded. All cables i.e. Control cable, Signal cable, Fiber Optic cable, Ethernet cable or Coaxial cable, if any, which are passing through damage prone area shall be armoured. - Cable glands shall be suitable for using at classified hazardous area. 10% spare cable pairs/glands/connectors should be provided for future use. All cables shall have sufficient length to carrying out pad drilling 1+2 (min 30 m extra).
10.1.6	UNINTERRUPTED POWER SUPPLY - All electronic equipment to be protected from power fluctuations and spikes by built in net filter and Online UPS. In case of power failure, the UPS after a defined time shall perform a safe shut down in order to protect the system, database and other software from data corruption. - Proper rated UPS for the system and the same shall be housed preferably along with Data Acquisition system in the Bunk House.

10.1.7	SOFTWARES Bidder shall provide all the necessary operating software along with License to operate the Server, Display Monitor, Data Acquisition system and Signal Processing Unit as applicable. The licenses of all software's supplied shall be in the name of Oil India Ltd with lifetime validity.
10.1.8	COMMUNICATION The system supplied by the bidder shall support WITSML format so that it can be communicated to external SCADA system.
10.1.9	CONFIGURATION TOOL Calibration and Configuration Unit (Laptop) for the system shall be supplied. Requisite calibrated application software to be loaded in the Laptop. The Laptop shall be of suitable configuration enabling it to load the drilling application Software so that; if required, the Laptop will be used by the OIL Engineers for configuration and viewing the drilling parameters.
10.1.10	HAZARDOUS AREA APPLICATION - Bidder shall provide filed sensors/hardwares suitable for use in Zone2, Class-I, Division-1 & 2, Group C & D with SIL 2/3 hazardous area as applicable for On-land drilling rigs. The certification for each unit and sensors to be used at classified hazardous area shall be from test facilities as mentioned in OMR 2017. - The test certificates from relevant laboratory shall be submitted to the inspection agencies at the time of inspection prior to despatch of materials. - The system shall provide Intrinsically Safe power to all the sensors installed on the hazardous locations.
10.1.11	LIST OF SENSORS - Weight Indicator sensors - Mud volume sensors - Return flow sensor - Electronic depth measuring sensor/encoder - SPM Sensors for Pumps - Pressure transducers (types as applicable) - Y-Connector- Change over adapter - Rotary RPM sensor

	i. Rotary torque sensor j. Mud temperature sensors (In/Out) k. Mud density sensors (In and Out) l. Mud Conductivity Sensors (In and OUT) 1. Quantities of the above sensors shall be supplied to be as per design of the Rig system by OEM. 2. All other sensors which may be required with their respective quantities shall be provided such that the system shall be functionally and operationally complete.
10.2	ONLINE GAS MONITORING SYSTEM The online gas monitoring system shall consists of but not limited to the following- 1. Three (3) nos. LEL sensors (Infra-Red Type) one each for Rig floor, shale shaker & riser mouth. 2. Three (3) nos. H₂S sensors one each for Rig floor, shale shaker & riser mouth. 3. Gas sensors shall be suitable for use in Hazardous Zone 1, IP 66 or higher. 4. One controller along with storage device shall be provided so that data could be stored of at least last one month for retrieval whenever required in compatible formats. 5. Three (3) nos. weatherproof and flameproof Hooter cum Flasher. 6. Weather-proof panel with proper canopy and stand consisting of MCB, Safety switchgear, etc. shall be provided if the system is standalone. 7. Cables: XLPE Insulated armoured Cable of proper sizing and of sufficient length to carry out pad drilling 1 + 2 (minimum 30 meter extra) 8. Online UPS of proper rating shall be provided for uninterrupted operation of the system.
10.3	INTERCOM/PUBLIC ADDRESSING SYSTEM One suitable wireless/wired intercom system for the rig shall be supplied as per following details- a) Nine (9) nos. Microphone & Speakers shall be placed at all following locations: 1. DIC Room 2. Derrick Floor 3. Drillers Cabin 4. Dog House 5. VFD House 6. Monkey Board 7. AC PCR 8. Utility System 9. Assembly Point. b) The system shall be certified for use in Hazardous Area in drilling locations as applicable. c) The system shall have protecting Covers. d) Wall mounted system shall be provided for DIC room and VFD house with 3 metre coil cable for microphone. e) The system shall have capability of public address. f) All cables: power cables & signal cables used in PA system shall be armoured. g) Online UPS of proper rating shall be provided for uninterrupted operation of the system.

10.4	CCTV SYSTEM: CCTV system for safety while operation and monitoring shall be provided. The details of the system is as follows- a) Camera: 8 Nos. Locations: 1. Monkey Board (for vertical pipe handler) 2. Mast (for Casing operation) 3. Rig Floor Area 4. Drawworks 5. Shale Shaker Area 6. Cellar Pit Area 7. Near Inclined Walk (for cat walk) 8. Mup Pump. b) Display Monitor (for displaying video output). c) Control Unit for storage and control of all camera. d) The system shall be capable of storing CCTV footage in a storage device for at least last one-month period, which may be retrieved whenever required. e) Control of camera operation shall be provided in the driller's cabin.
10.4.1	Camera 1. Shall be pan/tilt/zoom(PTZ) type. 2. Shall have certification for use in Hazardous Areas Zone 1 as applicable. 3. Shall be fitted with explosion proof fittings. 4. All camera enclosure shall have IP67 or higher. 5. Operation Temp: 4 to 47 Deg. C. 6. Capable for Day/Night Vision (Low flux). 7. All cables, power or signal shall be armoured. 8. All CCTV cables shall be routed separately in a channel/compartament of cable trays (not along with power cables).
10.4.2	CCTV Display Monitor 1. Shall be able to display any one single camera view as well as all camera views in split screen. 2. Shall have certification for use in Hazardous Areas Zone 1 / Zone2, Class-I, Division-1 & 2, Group C&D with SIL 2/3 as applicable.

10.5	CONTROL OF OTHER SUBSYSTEMS The Rig envisaged shall be able to monitor and control different Rig equipment like Top Drive System, Iron roughneck & Hydraulic Cat-Head. Top Drive Controller The TDS control module shall be able to control the functions of the Top Drive System. Iron Roughneck Controller Iron Roughneck control module shall be able to control the functions of the Iron Roughneck. Hydraulic Cat-Head Controller The Hydraulic Cathead control module shall be able to control the functions of the Hydraulic Cat-Head.
10.6	LIST OF CALIBRATION EQUIPMENTS & SPECIAL TOOLS All special tools/calibration equipments required shall be supplied. The following are the list of calibration equipments & special tools that shall be supplied along with each Rig. 1. One (1) Fiber Optic Installation Tool Kit. All tools required, with instructions, to connect ST or SC fibre optic connectors. Includes Continuity Test Set and Visual Fault Locator. The tool kit should include splicing machine along with the crimping tool for fibre optic cable. Adequate ST/SC connectors shall be provided accordingly. (Applicable if Fiber Optic Cable is used in communication) 2. One (1) Calibration Adapter for LEL Sensors with LEL Gas cylinder 3. One (1) Calibration Adapter and calibration kit for H2S Sensors with cylinder. 4. One (1) Sensor Calibration Hand Pump Kit With All The Fittings For 10000psi 5. One (1) Calibrator, Volt/Ma, With Battery and Case 6. One (1) Calibrator, Multifunction, IS 7. One (1) Field bus devices calibrator (Communication module along with the software for checking field bus devices using laptop) (Applicable if the system supplied is provided with Fieldbus devices) 8. One (1) RJ-45 Crimping Tool 9. One (1) Digital Pressure Gauge (0-10000Psi resolution:1PSI) With test point fittings and hose 10. One (1) Digital Pressure Gauge (0-1000Psi resolution:0.01PSI) With test point fittings and hose 11. One (1) 4 – 20 mA Source/Loop Calibrator with battery and case.

10.7	DOCUMENTATION: a. Process and Instrument diagram of all systems – Six (6) sets b. Interconnection drawings and make and ratings of all components – Six (6) sets c. Packing lists(Bill of Material) and challans – Six (6) sets d. O&M manuals, equipment catalogues and test certificates. – Six (6) sets e. Final drawings - Six (6) sets along with soft copy – One(1) set f. Software Trouble Shooting Manual, Maintenance software package in the form of restore CDs, Wiring Diagrams, and Illustrated Parts List with Make and Model of all items and spares of the system to be maintained - Six (6) sets g. All the restore software, factory reset images and configurations to be provided after final commissioning. h. Hazardous Area certificates. i. Calibration certificates of all sensors and systems shall be supplied. j. ISO 9001 Certificate / Compliance
10.8	INSTALLATION AND COMMISSIONING a. Bidder shall install and commission all the systems related to instrumentation upto the satisfaction of OIL. For this purpose all arrangements and all the inputs/special tools required at the rig site or at any place and making all necessary clearances (including statutory DGMS clearance required if any), shall be done by the supplier. b. Bidder shall Calibrate, Test and Commission all the systems related to Instrumentation in the Rig. The bidder shall demonstrate the operation of all the systems including the displays, trending, Driller's Display Monitor screens, Tool Pusher Workstation screens etc, hardcopy printing of time and depth base logs to the satisfaction of the OIL engineers. c. This activity shall cover instrumentation systems checking, wiring checking, testing and calibration of sensors and field instruments, phasing up of individual equipment and the system as a whole. Necessary settings and configurations in the systems required to be done accordingly. After start up connection and powering up, all the systems shall be tested at no load and minimum/low load at OIL's well site. All equipment as well as the whole system shall work exactly as intended. Modification/ rewiring etc. if required may be carried out at this stage. d. Bidder shall provide required sufficient gas cartridges for calibration of LEL gas sensors and H2S sensors along with the operational spares during warranty period. e. All the sensors JB's and cable glands should be covered with the protecting covers/ Canopy for protection from rain and mud.

10.9	SAFETY COMPLIANCE a. All the above systems, Rig Instrumentation system, Online Gas Monitoring system, Intercom/PA system & CCTV system shall comply all the statutory norms. For this purpose all approvals and necessary clearances (including statutory DGMS approval required if any) shall be provided by the supplier. b. Bidder shall provide all system hardware along with field instruments/sensors suitable for use in Zone2, Class-I, Division-1 & 2, Group C&D with SIL 2/3 hazardous area as applicable for On-land drilling rigs. The certification for each unit and sensors to be used at classified hazardous area shall be from test facilities as mentioned in OMR 2017. c. All such test certificates, and approvals (if required) shall be submitted during FAT/inspection by OIL engineers, which shall be supplied along with the rigs upon delivery.
10.10	SPARES
10.10.1	COMMISSIONING SPARES The supplier shall provide adequate commissioning spares and consumables required during commissioning.
10.10.2	MANDATORY SPARES WITH EACH RIGS: The following Field Sensors & consumables shall be supplied with EACH Rig: The mandatory spares to be supplied along with the rigs during delivery which shall be inclusive of but not limited to the list mentioned below: [A] Rig Instrumentation System a) Weight Indicator sensor b) Mud volume sensor c) Return flow sensor d) SPM Sensor for Pumps e) Pressure transducers f) Y-Connector- Change over adapter g) Mud Density sensor h) Mud temperature sensor i) Encoder j) RPM sensor k) Torque sensor l) Mud Conductivity Sensor Note: Quantity as per Appendix –AA - VI

[B] Online Gas Monitoring System

- a. Gas detection sensor – LEL
- b. Gas detection sensor - H₂S
- c. Gas Control Card LEL
- d. Gas Control Card H₂S
- e. Weatherproof and flameproof Hooter cum Flasher

Note: Quantity as per **Appendix –AA – VI**

[C] CCTV system

- a. Camera
- b. Cables used for Camera system
- c. Cable Glands
- d. Connectors (Male and Female)

Note: Quantity as per **Appendix –AA – VI**

[D] Intercom/PA system

- a. Intercom (Microphone and speaker)
- b. Cables used for Intercom system
- c. Cable Glands
- d. Connectors (Male and Female)

Note: Quantity as per **Appendix –AA – VI**

[E] Other Controls

- a. All field sensors used, for monitoring and control in Drawworks
- b. All field sensors used for monitoring and control in TDS
- c. All field sensors used for monitoring and control in Hydraulic Cathead
- d. All field sensors used for monitoring and control in Iron Roughneck
- e. All joysticks along with control cards in driller's cabin

Note: Quantity as per **Appendix –AA – VI**

10.10.3	MANDATORY SPARES COMMON FOR ALL FIVE (05) RIGS The following spares shall be supplied common for all the five (05) rigs- a. Data Acquisition System b. Data Server c. Workstation for DIC bunk house d. HMI display monitor e. UPS f. Intercom/Public Address system Control Module g. UPS for Intercom h. CCTV system controller i. CCTV Display Monitor j. Gas Controller k. UPS for Online Gas Monitoring system l. Top Drive Control Module m. Hydraulic Cathead Control Module n. Iron roughneck Control Module COMMON MANDATORY SPARES FOR FIVE RIGS: Quantity as per Appendix –AA - VI
10.10.4	ANNUAL MAINTENANCE CONTRACT: Please Refer Section 11.9.6
10.10.5	INSTRUMENTATION TRAINING: Please refer section 14

	SECTION-11 : INSTRUCTIONS / NOTES
11.1	TRANSPORT DIMENSIONS LIMITATION & DESIGN:
11.1.1	All major items of the rig package viz. Power Control Room (PCR), VFD House, Power-pack, Draw-Works, Tanks, Pumps, Gen-sets, etc. shall be mounted on heavy duty self-loading skid used in oilfields.
11.1.2	OVERALL DIMENSION OF INDIVIDUAL ITEM HAVING SKID should not preferably exceed (including skid) 11.00 meter × 2.75 meter × 3.2 meter (L x W x H). However, for PCR, Power-pack, Mud pump & Draw Works same (including skid) may be up to 12.25-meter X 3.0 meter X 3.25 meter (L x W x H). (Bidder to confirm). Note: Lifting lugs & projections due to door handles shall be excluded from above dimensions.
11.1.3	OVERALL DIMENSION OF INDIVIDUAL ITEM WITHOUT SKID like, mast part, etc. should not preferably exceed 10.0-meter x 2.5 meter x 2.75 meter (L x W x H). However, for major derrick parts and other critical items, same may be up to 10.0 meter X 3.0 meter X 2.75 meter (L x W x H). In all cases the items shall be so designed that they can be evenly placed on trailers with proper load distribution as well as within the above specified dimensions of 2.5 meter width & 2.75 meter height for ease of transportation (3.0 meter width for major mast parts and other critical items as above). Dimensions of the sub base should not exceed 12meter X 3meter X 2.5meter (L X B X H). (Bidder to confirm).
11.1.4	The overall weight of single individual item (with or without skid) including all accessories mounted on it and the skid as applicable should be as minimum as possible and should not preferably exceed 22.0 MT. However, weight of major items like PCR, Power-pack & Sub base etc. can be up to 30.0 MT and for Mud Pump, Drawworks should not exceed 35 MT. If the weight of Mud pumps & Draw works exceeds 35 MT, provision to be kept for dismantling accessories to reduce the weight to 35 MT before transportation (Bidder to confirm). In no case, shall weight of any material/item/sub-part exceed 35MT before transportation. (Bidder to confirm). Also, Bidder to categorically confirm whether dismantling of parts of such equipment is recommended or not.
11.1.5	Each longitudinal channel of a skid shall be of single length and shall have smooth finish underneath and curve finish at both the end, so that the skid can roll over smoothly on surfaces/truck body without any obstruction. (Bidder to confirm). 6. For skids of width 2.5 meter & above, there should be at least 4(four) longitudinal channels with two mid channels kept sufficiently apart so that the unit can be placed evenly on narrow trailers (general width of trailers 2.4 to 2.6 meters only) with proper load distribution & balancing. This is essential as because for a skid of width 2.5 meter & above, the extreme two side channels shall rest only partially on a narrow trailer platform. (Bidder to confirm).
11.1.6	For skids of width 2.5 meter & above, there should be at least 4(four) longitudinal channels with two mid channels kept sufficiently apart so that the unit can be placed evenly on narrow trailers (general width of trailers 2.4 to 2.6 meters only) with proper load distribution & balancing. This is essential as because for a skid of width 2.5 meter & above, the extreme two side channels shall rest only partially on a narrow trailer platform. (Bidder to confirm).

11.1.7	The skid so designed should be sufficiently strong and properly welded at joints and should be able to withstand shocks which are bound to come while being handled and transported over rough and slushy roads/locations. Height of the joint used for the longitudinal members should be minimum 20 cm. (Bidder to confirm).
11.1.8	As far as possible, the length of the skid should be at least 1.00 meter longer than the overall length of the equipment mounted on it, and same equally distributed on either ends. On no account should a skid be less than 3.00 meter in length irrespective of the length of the equipment mounted on it. CG (Centre of Gravity) of the equipment with the skid should be at centre of the complete unit to the extent possible. (Bidder to confirm).
11.1.9	The roof and sidewalls of equipment, tools hut, bunkhouse, etc, as applicable, should be rounded off at the corners for safe & ease of loading, offloading & transportation. (Bidder to confirm).
11.1.10	Suitable lifting lugs should be provided for each individual item. For items with skid, 4(four) lugs at each corner of the skid should be provided.
11.2	PAINTING INSTRUCTIONS: At least 3 coats after applying primer. Under Coating with Anti Corrosive Treatment for cement & rust and polyurethane paint. The preferred colour shade should be as under. 1. MAST (Bottom Section) - WHITE 2. MAST (Top 20 ft. Section) - RED 3. CROWN - RED 4. RACKING BOARD - WHITE 5. ALL HAND RAILS - YELLOW 6. MUD PUMPS - BLUE 7. MUD PUMP SKID - GREY 8. TRAVELLING BLOCK - YELLOW 9. DRAW-WORKS - BLUE 10. AIR TANK / UTILITY HUT - WHITE 11. MUD & WATER TANK - GREY 12. VFD CONTROL ROOM - WHITE 13. HSD TANK - SILVER * All operating and warning labels on equipment should be in English. ** OIL logo plate shall be provided / riveted on Driller's cabin (Back and catwalk side). *** Rig Number shall be prominently displayed on the belly board.

11.3	TEST CERTIFICATE: All equipment are to be tested as per relevant API standard/ Factory acceptable test. Supplier has to provide all test certificates along with the delivery of Rig. Also calibration certificate wherever required shall be provided. Also supplier needs to provide NDT report, hydro-test report, thickness test report, and hydraulic system test report. All the test reports/certificate shall be provided in data book (hard bound) [2 copies] and in USB Flash Drive with each Rig. Offers will be rejected in the absence of such confirmation. Manufacturer/Supplier must categorically confirm regarding compliance to above. Offers will be liable for rejection in the absence of such confirmation.
11.4	SPARE PARTS: Spares for four year normal operation (Other than what is specified in the tender and mentioned under AMC) of all equipment / system should be additionally included in the offer indicating item, part no. & quantity required. Item wise price of such spares should also be provided in commercial bid (price bid). Bidder should indicate the part nos. against each item along with OEM's part no. if any. The price of such spares shall not be revised for next five (05) years from the date of commissioning of first lot rigs and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years. Such spares will not be considered for bid evaluation. Bidder shall provide technical specifications for general items like Service Hoses, Metallic Tubing, Hose Fittings, Belts, Bearings, pipefittings etc. if order is awarded to him.
11.5	PARTS CATALOGUE, OPERATION / INSTRUCTION MANUAL & DRAWING, TECHNICAL INFORMATION & BULLETIN: The successful bidder should provide at least one set of parts list, operations manual & service manual covering all the items & its accessories including any special / alignment tools for the same along with the technical offer. Technical details of the engine, draw-works, mast & sub-structure, top drive, rig controls, mud system, electrical system with dimensional drawing (including circuit diagrams) must also be forwarded along with the technical offer. The supplier should provide the following information wherever applicable along with the technical details: a) Dynamic load b) Static load c) Unbalance load d) Location of centre of gravity.

	The catalogue should include • Weight of each & every major equipment / component such as draw-works, mud pump mast (section-wise and total mast), engine, sub-structure (section-wise and total substructure), crown block, travelling block etc. • All principal dimensions, including those required for foundation / skid mounting & maintenance clearance. • All horizontal & vertical clearance required for assembling & dismantling. Installation, operation & maintenance manual should cover the following: • Start up, normal shut down, emergency shutdown, operating limits & operational procedures. • Rig-up & rig-down sequence. • Layout drawing of all components on the unit with details of load distribution Foundation & site layout drawings with load bearing capacity / distribution for various components of the rig package covering the following: • Assumed parameters of design of CC / RCC foundations shall be furnished. • The Safe Bearing Capacity (CBC) of soil may be assumed as 8 Ton/ sq.mtr. (1486 lbs/sq.ft.) for design of the CC / RCC foundations. • All design for foundation shall confirm to BIS - 456:2000. • For machine Foundation the code to be followed are IS-2974 7 is 13301 respectively.
11.6	MANUALS & CATALOGUES: Supply of 6 (Six) sets of Catalogue indicating exploded view of each & every Spare Parts with part nos. & quantity, Workshop & Service Manual, etc. for all major components/systems like Engines, Draw-works, Mast & Sub-structure, Top Drives, hoisting & rotating Equipment, mud system & solid control Equipment, electrical system, etc. including its sub-assemblies <u>complete with all schematics</u> along with the unit. In addition, supply of 4 (Four) sets catalogue/manual in USB Drive. All manuals & catalogues should be in English (UK & US).
11.7	DOCUMENTATION AND BID SUBMISSION: Bidder's response should clearly be defined – specific details/specifications are to be provided in the bid. Response like – 'As per NIT Specifications/ Technical Leaflet', 'Noted', 'Accepted' or in any similar fashion will not be accepted and will be treated as non-responsive. <u>The following documents shall be submitted along with the bid for bid evaluation</u> Technical leaflets with detailed dimensional diagram and specifications, Make & Model of each & every accessory / system, etc. Copies of valid API Spec 4F, 7-1, 7K, 8C & 9A respectively of other concerned manufacturer(s) in case of the equipment / component outsourced by bidder.

11.8	GUARANTEE / WARRANTY: Please refer Item note for Guarantee/Warranty clauses.
11.9	ANNUAL MAINTENANCE CONTRACT: Bidder should also confirm in their technical bid that they will agree for an Annual Maintenance Contract (AMC) with OIL for carrying out the job as indicated against scope of work on regular basis. The charges for such AMC should be indicated in the commercial bid (price bid). The bidder should indicate the year-wise break-up of AMC charges for four (04) years from the date completion of warranty period as per the price bid format. This will be considered in evaluation of the offers. OIL reserves the right to enter into an Annual Maintenance Contract (AMC) after completion of warranty period of each rig package at bidder's quoted AMC charges.
11.9.1	AMC-TOP DRIVE SYSTEM (TDS):
11.9.1.1	SCOPE OF WORK: ON-SITE maintenance, troubleshooting and support service for 5 sets of TDS and controls of newly procured OIL's 5 numbers of 2000 VFD rigs which includes but not limited to the following: a) Supervisory services shall be provided during rig-up, rig-down & inter location movement. b) Supervisory services for maintenance, troubleshooting & providing support services during course of a well for keeping the complete TDS packages in good health. c) Familiarizing the rig crew with the complete equipment/systems and imparting hands-on training for basic operation, troubleshooting and maintenance. d) Rectification of any problems, abnormalities, anomalies and defects noticed/logged during the course of a well, so that there shall be uninterrupted drilling activity. e) Preparation of inventory and spares list. f) The service provider shall have to carry out maintenance of the bought out items also installed in the TDS package or arrange for the services required from the OEM of such items. g) The service provider shall arrange for hiring / summoning the services of technical experts in case site engineer is unable to rectify/ troubleshoot a particular problem, at no extra cost to OIL. h) In case any defect or functional anomaly is noticed/predicted during any maintenance activity, or pointed out by Oil India, SERVICE PROVIDER shall rectify the same to the complete satisfaction of Oil India. i) The AMC shall also cover maintenance of systems/equipment newly added or replaced during operational or statutory requirements. j) The maintenance package shall include services of Service Team along with provision of all special tools, tackles, instruments etc.

	k) The persons shall be fully conversant with the complete TDS system & controls. They should be physically fit for working in the well site. They should also be able to work with his own hands. l) The manpower & tools including OIL's own workshop facility, if required for carrying out the maintenance & trouble shooting, will be made available by OIL. m) The Service Provider shall provide a detailed maintenance check list detailing OIL INDIA LTD's responsibility on Daily/weekly maintenance of Top Drives. n) The personnel(s) of service provider should preferably be Indian citizens and fully trained by service provider to carry out the AMC. o) Accommodation, food, boarding & lodging will NOT be provided by OIL and that is the service provider's scope.
11.9.1.2	SPARES & CONSUMABLES: a) Bidder to recommend/offer spares for four (04) years of normal operation of all equipment / system in the offer indicating item, part no. & quantity required. Item wise price of such spares should also be provided in commercial bid (price bid). Bidder should indicate the part nos. against each item along with OEM's part no. if any. The cost of these spares will NOT be considered for price comparison. The price of such spares shall not be revised for next Five (05) years from the date of commissioning of first lot of rigs and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years. b) Replaced defective spares, if any shall be deposited to Oil India Limited.
11.9.1.3	SPECIAL TOOLS/CALIBRATORS: a) The Service Provider shall arrange for all the tools & tackles and instruments for carrying out the maintenance & troubleshooting of the TDS & Controls. Any special tools and instruments required for maintenance & troubleshooting shall be arranged by the service provider without any extra cost to OIL. b) OIL's own existing workshop facility will be made available to SERVICE PROVIDER for carrying out the maintenance, repair, calibration & troubleshooting. In case any other W/S facility (in excess of that presently available with Oil India) is required, SERVICE PROVIDER shall arrange for the same.
11.9.1.4	QUALITY OF SERVICE:
a)	All instruments, equipment etc. proposed to be used under this AMC should be calibrated, and copies of all such certificates to be provided to OIL on demand. SERVICE PROVIDER shall ensure that such certificates remain valid for the duration of the AMC.
b)	Service provider shall carry out the maintenance as per the Original manufacturer recommendation.

c)	Reporting: The Service Provider shall provide the following reports to OIL, as per frequency indicated against each report / document:		
	Sl. No	Description of Reports	Frequency of reporting
	1	Periodic Maintenance Schedule for all equipment of TDS	Once, at the start of the contract.
	2	Maintenance Activity	Quarterly – 4 times, Half-yearly-2 times, Yearly- Once.
	3	Equipment Test/Calibration/Breakdown reports	Whenever equipment /Spares etc. are repaired/ replaced with new ones.
	4	Commissioning / Re-deployment report for all equipment under AMC.	At the beginning of every new location to be drilled.
d)	Safety: All safety procedures and guidelines are to be followed at all the time when in Drilling site. Providing proper safety appliances such as safety boots, helmets, hand gloves and protective clothing etc. to their personnel shall be Service Provider's responsibility.		
e)	Statutory Compliance: All relevant provisions of the following (or the latest amendments there to) shall comply by the Service Provider to this AMC, as well as personnel deployed- • OMR, 2017 • OISD standards • DGMS guidelines • CPCB / APCB environment and anti-pollution guidelines • OIL Safety and Environment guidelines		

11.9.1.5	MANPOWER: The Service Team shall comprise of qualified and experienced service personnel as per following details.			
	Sl. No.	Purpose of visit	Service Team	
			Service Engineer Technician	
	1	Rig Move (Rig-up & Rig-down)	1 No.	1 No.
	2	Quarterly Maintenance	2 Nos.	1 No.
	3	Half-yearly Maintenance	2 Nos.	1 No.
	4	Yearly Maintenance	2 Nos.	1 No.
	5	Troubleshooting (On call basis)	As per requirement (To be decided depending on the nature of repair work)	
a)	Service Engineer i. Should have a Degree preferably in Instrumentation/Electrical/Mechanical Engineering with a minimum of 3 years experience or Diploma preferably in Instrumentation/Electronics/Mechanical Engineering with a minimum of 5 yrs. experience as an Engineer in Diesel Electric (AC-VFD) drilling rigs. ii. Should have sound knowledge of TDS system& controls and have experience of carrying out maintenance of such systems. iii. Should be confident in independently carrying out troubleshooting, fault finding analysis, rectification of fault, configuration, operation and maintenance of all the items & field instruments/sensors of TDS of (AC-VFD) drilling rigs. Should be conversant with Oil Mines Regulations and OISD.			

b)	Technician: i) Must be diploma with minimum 3 yrs. Experience or ITI preferably in Instrumentation/Electronics/Mechanical with minimum 5 yrs. Experience respectively in the operation and maintenance of diesel electric (AC-VFD) drilling rigs. ii) Should have sound knowledge of TDS system& controls.
c)	Note: i) The service provider may deploy unskilled helper as and when required with prior permission from OIL. ii) An undertaking from Contractor's all personnel should be submitted to Company after deployment of manpower prior to commencement of work/completion of mobilization, denouncing any claim on employment or any service benefit from OIL. iii) The personnel deployed by the Contractor should comply with all the safety norms applicable during operation. iv) Medical Fitness: The Contractor shall ensure that all of the Contractor's Personnel shall have a full medical examination (by a qualified and registered doctor) prior to commencement of the Drilling operation and the certificates of all such personnel in form 'O' of The Mines Act 1952 should be submitted by the contractor.
d)	Training Courses: i) The Contractor shall ensure that all of the Contractor's Personnel performing services hereunder shall have attended all relevant safety and operational training courses such as Mines Vocational Training (MVT), First Aid Certificate course (FAC), Fire Fighting (FF), etc. required by "The Mines Act 1952" & "OISD Guidelines" and as is generally consistent with international petroleum industry practice and/or as otherwise required by the Company. ii) The Contractor shall submit copies of all such certificates prior to mobilization & also keep such records at well site.
e)	Approval Of Manpower: i) Contractor shall have to obtain prior approval from the Company before deployment of personnel in the rig. Applications seeking approval for deployment shall be submitted to GM- Drilling Operation and shall be forwarded to concerned department for scrutiny. ii) The following documents shall have to be submitted along with the letter seeking approval. a) Bio-data of the candidate with photograph. b) Photo copy of relevant pass certificates and other proficiency certificate. c) Copy of experience certificates (original to be produced on demand). iii) Bidder shall furnish bio-data of key personnel with their photographs along with the techno-commercial bid of the AMC. iv) The Company reserves the right to instruct the Service provider for removal of any Service provider's personnel who in the opinion of the Company is technically not competent or not rendering the services faithfully, or due to other reasons. However, the

	replacement personnel also must have the qualification/experience as indicated above. The Service provider should submit qualification/bio-data /photographs/experience/track record of the replacement personnel and obtain prior approval from the Company for their deployment. Replacement of personnel will be fully at the cost of the Contractor and shall be made by the Contractor within ten (10) days of such instruction.
11.9.2	<u>AMC-IRON ROUGHNECK</u>
11.9.2.1	<u>SCOPE OF WORK:</u> ON-SITE maintenance, troubleshooting and support service for 5 sets of Iron Roughnecks of newly procured OIL's 5 numbers of 2000 VFD rigs, which includes but not limited to the following: a) Familiarizing the rig crew with the complete equipment/system and imparting hands-on training for basic operation, troubleshooting and maintenance. b) Supervisory services shall be provided during rig-up and rig-down. c) Supervisory services for maintenance, troubleshooting & providing support services during course of a well for keeping the Iron Roughneck packages in good health. d) Rectification of any problems, abnormalities, anomalies and defects noticed/logged during the course of a well, so that there shall be uninterrupted drilling activity. e) Preparation of inventory and spares list. f) The service provider shall have to carry out maintenance of the bought out items also installed in the Iron Roughneck package or arrange for the services required from the OEM of such items. g) The service provider shall arrange for hiring / summoning the services of technical experts in case site engineer is unable to rectify/ troubleshoot a particular problem, at no extra cost to OIL. h) In case any defect or functional anomaly is noticed/predicted during any maintenance activity, or pointed out by Oil India, SERVICE PROVIDER shall rectify the same to the complete satisfaction of Oil India. i) The AMC shall also cover maintenance of systems/equipment newly added or replaced during operational or statutory requirements. j) The maintenance package shall include services of Service Engineer and the Service Team along with provision of all special tools, tackles, instruments etc. k) The service team shall be fully conversant with the Iron Roughneck system & controls. They should be physically fit for working in the well site. The service personnel(s) shall also be able to work with their own hands. l) The manpower & tools including OIL's own workshop facility, if required for carrying out the maintenance & trouble shooting, will be made available by OIL. m) The Service Provider shall provide a detailed maintenance check list detailing OIL INDIA LTD's responsibility on Daily/weekly maintenance of the Iron Roughnecks. n) The personnel(s) of service provider should preferably be Indian citizens and fully trained by service provider to carry out the AMC.

	o) Accommodation, food, boarding & lodging will NOT be provided by OIL and that is the service provider's scope.
11.9.2.2	SPARES & CONSUMABLES: a) Bidder to recommend/offer spares for Four (04) years of normal operation of all equipment / system in the offer indicating item, part no. & quantity required. Item wise price of such spares should also be provided in commercial bid (price bid). Bidder should indicate the part nos. against each item along with OEM's part no. if any. The cost of these spares will NOT be considered for price comparison. The price of such spares shall not be revised for next Five (05) years from the date of commissioning of first lot of rigs and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years. b) Clause deleted in the amendment. C) Replaced defective spares, if any shall be deposited to Oil India Limited.
11.9.2.3	<u>SPECIAL TOOLS/CALIBRATORS:</u> a) The Service Provider shall arrange for all the tools & tackles and instruments for carrying out the maintenance & troubleshooting of the Iron Roughnecks& Controls.Any special tools and instruments required for maintenance & troubleshooting shall be arranged by the service provider without any extra cost to OIL. b) OIL's own existing workshop facility will be made available to SERVICE PROVIDER for carrying out the maintenance, repair, calibration & troubleshooting. In case any other W/S facility (in excess of that presently available with Oil India) is required, SERVICE PROVIDER shall arrange for the same.
11.9.2.4	<u>QUALITY OF SERVICE:</u>
a)	All instruments, equipment etc. proposed to be used under this AMC should be calibrated, and copies of all such certificates to be provided to OIL on demand. SERVICE PROVIDER shall ensure that such certificates remain valid for the duration of the AMC.
b)	Service provider shall carry out the maintenance as per the Original manufacturer recommendation.
c)	Reporting: The Service Provider shall provide the following reports to OIL, as per frequency indicated against each report / document:

	Sl. No	Description of Reports	Frequency of reporting
	1	PM Schedule for all equipment of Iron Roughneck	Once, at the start of the contract.
	2	Maintenance Activity	Quarterly – 4 times, Half-yearly-2 times, Yearly- Once.
	3	Equipment Test/Calibration/Breakdown reports	Whenever equipment /Spares etc. are repaired/ replaced with new ones.
	4	Commissioning / Re-deployment report for all equipment under AMC.	At the beginning of every new location to be drilled.
d)	Safety: All safety procedures and guidelines are to be followed at all the time when in Drilling site. Providing proper safety appliances such as safety boots, helmets, hand gloves and protective clothing etc. to their personnel shall be Service Provider's responsibility.		
e)	Statutory Compliance: All relevant provisions of the following (or the latest amendments there to) shall comply by the Service Provider to this AMC, as well as personnel deployed- • OMR, 2017 • OISD standards		

	• DGMS guidelines • CPCB / APCB environment and anti-pollution guidelines • OIL Safety and Environment guidelines			
11.9.2.5	<u>MANPOWER:</u> The Service Team shall comprise of qualified and experienced service personnel as per following details.			
	Sl. No.	Purpose of visit	Service Team	
			Service Engineer	Technician
	1	Rig Move (Rig-up & Rig-down)	1 No.	1 No.
	2	Quarterly Maintenance	NIL	1 No.
	3	Half-yearly Maintenance	NIL	1 No.
	4	Yearly Maintenance	1 No.	1 No.
	5	Troubleshooting (On call basis)	As per requirement (To be decided depending on the	As per requirement (To be decided depending on the nature of repair work)

			nature of repair work)	
a)	Service Engineer i. Should have a Degree preferably in Instrumentation/Electrical/Mechanical Engineering with a minimum of 3 years experience or Diploma preferably in Instrumentation/Electronics/Mechanical Engineering with a minimum of 5 yrs. experience as an Engineer in Diesel Electric (AC-VFD) drilling rigs. ii. Should have sound knowledge of Iron Roughneck system& controls and have experience of carrying out maintenance of such systems. iii. Should be confident in independently carrying out troubleshooting, fault finding analysis, rectification of fault, configuration, operation and maintenance of all the items & field instruments/sensors of Centrifuge of (AC-VFD) drilling rigs. iv. Should be conversant with Oil Mines Regulations and OISD.			
b)	Technician: i) Must be diploma with minimum 3 yrs. Experience or ITI preferably in Instrumentation/Electrical/Mechanical with minimum 5 yrs. Experience respectively in the operation and maintenance of Iron Roughneck in diesel electric (AC-VFD) drilling rigs. ii) Should have sound knowledge of Iron Roughneck system& controls.			
c)	Note: i) The service provider may deploy unskilled helper as and when required with prior permission from OIL. ii) An undertaking from Contractor's all personnel should be submitted to Company after deployment of manpower prior to commencement of work/completion of mobilization denouncing any claim on employment or any service benefit from OIL. iii) The personnel deployed by the Contractor should comply with all the safety norms applicable during operation. iv) Medical Fitness: The Contractor shall ensure that all of the Contractor's Personnel shall have a full medical examination (by a qualified and registered doctor) prior to commencement of the Drilling operation and the certificates of all such personnel in form 'O' of The Mines Act 1952 should be submitted by the contractor.			
d)	Training Courses: i) The Contractor shall ensure that all of the Contractor's Personnel performing services hereunder shall have attended all relevant safety and operational training courses such as Mines Vocational Training (MVT), First Aid Certificate course (FAC), Fire Fighting (FF), etc. required by "The Mines Act 1952" & "OISD Guidelines" and as is generally consistent with international petroleum industry practice and/or as otherwise required by the Company.			

	ii) The Contractor shall submit copies of all such certificates prior to mobilization & also keep such records at well site.
e)	Approval Of Manpower: i) Contractor shall have to obtain prior approval from the Company before deployment of personnel in the rig. Applications seeking approval for deployment shall be submitted to GM- Drilling Operation and shall be forwarded to concerned department for scrutiny. ii) The following documents shall have to be submitted along with the letter seeking approval. a) Bio-data of the candidate with photograph. b) Photo copy of relevant pass certificates and other proficiency certificate c) Copy of experience certificates (original to be produced on demand). iii) Bidder shall furnish bio-data of key personnel with their photographs along with the techno-commercial bid of the AMC iv) The Company reserves the right to instruct the Service provider for removal of any Service provider's personnel who in the opinion of the Company is technically not competent or not rendering the services faithfully, or due to other reasons. However, the replacement personnel also must have the qualification/experience as indicated above. The Service provider should submit qualification/bio-data /photographs/experience/track record of the replacement personnel and obtain prior approval from the Company for their deployment. Replacement of personnel will be fully at the cost of the Contractor and shall be made by the Contractor within ten (10) days of such instruction.
11.9.3	<u>AMC-CENTRIFUGE:</u>
11.9.3.1	<u>SCOPE OF WORK:</u> ON-SITE maintenance, troubleshooting and support service for 5 sets of Centrifuges of newly procured OIL's 5 numbers of 2000 VFD rigs, which includes but not limited to the following: a) Familiarizing the rig crew with the complete equipment/system and imparting hands-on training for basic operation, troubleshooting and maintenance. b) Supervisory services shall be provided during rig-up and rig-down. c) Supervisory services for maintenance, troubleshooting & providing support services during course of a well for keeping the complete centrifuge packages in good health. d) Rectification of any problems, abnormalities, anomalies and defects noticed/logged during the course of a well, so that there shall be uninterrupted drilling activity. e) Preparation of inventory and spares list. f) The service provider shall have to carry out maintenance of the bought out items also installed in the Centrifuge package or arrange for the services required from the OEM of such items. g) The service provider shall arrange for hiring / summoning the services of technical experts in case the site engineer is unable to rectify/ troubleshoot a particular problem, at no extra cost to OIL.

	h) In case any defect or functional anomaly is noticed/predicted during any maintenance activity, or pointed out by Oil India, SERVICE PROVIDER shall rectify the same to the complete satisfaction of Oil India. i) The AMC shall also cover maintenance of systems/equipment newly added or replaced during operational or statutory requirements. j) The maintenance package shall include services of Service Engineer and the Service Team along with provision of all special tools, tackles, instruments. k) The service team shall be fully conversant with the centrifuge system & controls. They should be physically fit for working in the well site. The service personnel shall also be able to work with their own hands. l) The manpower & tools including OIL's own workshop facility, if required for carrying out the maintenance & trouble shooting, will be made available by OIL. m) The Service Provider shall provide a detailed maintenance check list detailing OIL INDIA LTD's responsibility on Daily/weekly maintenance of the centrifuge. n) The personnel(s) of service provider should preferably be Indian citizens and fully trained by service provider to carry out the AMC. o) Accommodation, food, boarding & lodging will NOT be provided by OIL and that is the service provider's scope.
11.9.3.2	SPARES & CONSUMABLES: a) Bidder to recommend/offer spares for Four (04) years of normal operation of all equipment / system in the offer indicating item, part no. & quantity required. Item wise price of such spares should also be provided in commercial bid (price bid). Bidder should indicate the part nos. against each item along with OEM's part no. if any. The cost of these spares will NOT be considered for price comparison. The price of such spares shall not be revised for next Five (05) years from the date of commissioning of first lot of rigs and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years. b) Replaced defective spares, if any shall be deposited to Oil India Limited.
11.9.3.3	a) <u>SPECIAL TOOLS/CALIBRATORS:</u> b) The Service Provider shall arrange for all the tools & tackles and instruments for carrying out the maintenance & troubleshooting of the centrifuge& Controls. Any special tools and instruments required for maintenance & troubleshooting shall be arranged by the service provider without any extra cost to OIL. c) OIL's own existing workshop facility will be made available to SERVICE PROVIDER for carrying out the maintenance, repair, calibration & troubleshooting. In case any other W/S facility (in excess of that presently available with Oil India) is required, SERVICE PROVIDER shall arrange for the same.
11.9.3.4	<u>QUALITY OF SERVICE:</u>
a)	All instruments, equipment etc. proposed to be used under this AMC should be calibrated, and copies of all such certificates to be provided to OIL on demand. SERVICE PROVIDER shall ensure that such certificates remain valid for the duration of the AMC.

b)	Service provider shall carry out the maintenance as per the Original manufacturer recommendation.		
c)	Reporting: The Service Provider shall provide the following reports to OIL, as per frequency indicated against each report / document:		
	Sl. No	Description of Reports	Frequency of reporting
	1	PM Schedule for all equipment of centrifuge	Once, at the start of the contract.
	2	Maintenance Activity	Quarterly – 4 times, Half-yearly-2 times, Yearly- Once.
	3	Equipment Test/Calibration/Breakdown reports	Whenever equipment /Spares etc. are repaired/ replaced with new ones.
	4	Commissioning / Re-deployment report for all equipment under AMC.	At the beginning of every new location to be drilled.
d)	Safety: All safety procedures and guidelines are to be followed at all the time when in Drilling site. Providing proper safety appliances such as safety boots, helmets, hand gloves and protective clothing etc. to their personnel shall be Service Provider's responsibility.		

e)	a) Statutory Compliance: All relevant provisions of the following (or the latest amendments there to) shall comply by the Service Provider to this AMC, as well as personnel deployed- • OMR, 2017 • OISD standards • DGMS guidelines • CPCB / APCB environment and anti-pollution guidelines • OIL Safety and Environment guidelines			
11.9.3.5	MANPOWER: The Service Team shall comprise of qualified and experienced service personnel as per following details.			
	Sl. No.	Purpose of visit	Service Team	
			Service Engineer	Technician
	1	Rig Move (Rig-up & Rig-down)	1 No.	1 No.
	2	Quarterly Maintenance	NIL	1 No.
	3	Half-yearly Maintenance	NIL	1 No.
	4	Yearly Maintenance	1 No.	1 No.
	5	Troubleshooting (On call basis)	As per requirement (To be decided depending on the nature	As per requirement (To be decided depending on the nature of repair work)

			of repair work)	
a)	Service Engineer i. Should have a Degree preferably in Instrumentation/Electrical/Mechanical Engineering with a minimum of 3 years experience or Diploma preferably in Instrumentation/Electronics/Mechanical Engineering with a minimum of 5 yrs. experience as an Engineer in Diesel Electric (AC-VFD) drilling rigs. ii. Should have sound knowledge of Centrifuge system& controls and have experience of carrying out maintenance of such systems. iii. Should be confident in independently carrying out troubleshooting, fault finding analysis, rectification of fault, configuration, operation and maintenance of all the items & field instruments/sensors of Centrifuge of (AC-VFD) drilling rigs. iv. Should be conversant with Oil Mines Regulations and OISD.			
b)	Technician: i) Must be diploma with minimum 3 yrs. Experience or ITI preferably in Instrumentation/Electrical/Mechanical with minimum 5 yrs. Experience respectively in the operation and maintenance of centrifuge in diesel electric (AC-VFD) drilling rigs. ii) Should have sound knowledge of centrifuge system& controls.			
c)	Note: i) The service provider may deploy unskilled helper as and when required with prior permission from OIL. ii) An undertaking from Contractor's all personnel should be submitted to Company after deployment of manpower prior to commencement of work/completion of mobilization denouncing any claim on employment or any service benefit from OIL iii) The personnel deployed by the Contractor should comply with all the safety norms applicable during operation. iv) Medical Fitness: The Contractor shall ensure that all of the Contractor's Personnel shall have a full medical examination (by a qualified and registered doctor) prior to commencement of the Drilling operation and the certificates of all such personnel in form 'O' of The Mines Act 1952 should be submitted by the contractor.			
d)	Training Courses: i) The Contractor shall ensure that all of the Contractor's Personnel performing services hereunder shall have attended all relevant safety and operational training courses such as Mines Vocational Training (MVT), First Aid Certificate course (FAC), Fire Fighting (FF), etc. required by "The Mines Act 1952" & "OISD Guidelines" and as is generally consistent with international petroleum industry practice and/or as otherwise required by the Company. ii) The Contractor shall submit copies of all such certificates prior to mobilization & also keep such records at well site.			

e)	Approval Of Manpower: i) Contractor shall have to obtain prior approval from the Company before deployment of personnel in the rig. Applications seeking approval for deployment shall be submitted to GM- Drilling Operation and shall be forwarded to concerned department for scrutiny. ii) The following documents shall have to be submitted along with the letter seeking approval. a) Bio-data of the candidate with photograph. b) Photo copy of relevant pass certificates and other proficiency certificate c) Copy of experience certificates (original to be produced on demand). iii) Bidder shall furnish bio-data of key personnel with their photographs along with the techno-commercial bid of the AMC iv) The Company reserves the right to instruct the Service provider for removal of any Service provider's personnel who in the opinion of the Company is technically not competent or not rendering the services faithfully, or due to other reasons. However, the replacement personnel also must have the qualification/experience as indicated above. The Service provider should submit qualification/bio-data /photographs/experience/track record of the replacement personnel and obtain prior approval from the Company for their deployment. Replacement of personnel will be fully at the cost of the Contractor and shall be made by the Contractor within ten (10) days of such instruction.
11.9.4	<u>AMC-CASING RUNNING TOOL:</u>
11.9.4.1	<u>SCOPE OF WORK:</u> ON-SITE support service, maintenance and troubleshooting for 5 sets of Casing Running Tool of newly procured OIL's 5 numbers of 2000 VFD rigs, which includes but not limited to the following: a) Familiarizing the rig crew with the complete equipment/system and imparting hands-on training for operation, basic troubleshooting and maintenance. b) Supervisory services shall be provided during rig-up, rig-down and casing running in operation. c) During their visit to well site for rig-up, rig-down and casing running operation, the service team shall also carry out necessary maintenance/servicing of the tools/equipment. d) Rectification of any problems, abnormalities, anomalies and defects noticed during rig-up, rig-down and casing running operation, so that there shall be uninterrupted drilling activity. e) Preparation of inventory and spares list. f) The service provider shall have to carry out maintenance of the bought out items also installed in the Casing Running Tool or arrange for the services required from the OEM of such items. g) The service provider shall arrange for hiring / summoning the services of technical experts in case the site engineer is unable to rectify/ troubleshoot a particular problem, at no extra cost to OIL. h) In case any defect or functional anomaly is noticed/predicted during any maintenance activity, or pointed out by Oil India, SERVICE PROVIDER shall rectify the same to the complete satisfaction of Oil India. i) The AMC shall also cover maintenance of systems/equipments newly added or replaced during operational or statutory requirements.

	j) The maintenance package shall include services of Service Engineer and the Service Team along with provision of all special tools, tackles, instruments. k) The service team shall be fully conversant with the Casing Running Tool& controls. They should be physically fit for working in the well site. The service personnel(s) shall also be able to work with their own hands. l) The manpower & tools including OIL's own workshop facility, if required for carrying out the maintenance & trouble shooting, will be made available by OIL. m) The Service Provider shall provide a detailed maintenance check list detailing OIL INDIA LTD's responsibility on periodic maintenance of the Casing Running Tool. n) The personnel(s) of service provider should preferably be Indian citizens and fully trained by service provider to carry out the AMC. o) Accommodation, food, boarding & lodging will NOT be provided by OIL and that is the service provider's scope.
11.9.4.2	SPARES & CONSUMABLES: a) Bidder to recommend / offer spares for Four (04) years of normal operation of all equipment / system in the offer indicating item, part no. & quantity required. Item wise price of such spares should also be provided in commercial bid (price bid). Bidder should indicate the part nos. against each item along with OEM's part no. if any. The cost of these spares will NOT be considered for price comparison. The price of such spares shall not be revised for next Five (05) years from the date of commissioning of first lot of rigs and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years. b) Replaced defective spares, if any shall be deposited to Oil India Limited.
11.9.4.3	<u>SPECIAL TOOLS/CALIBRATORS</u> a) The Service Provider shall arrange for all the tools & tackles and instruments for carrying out the maintenance & troubleshooting of the Casing Running Tool& Controls. Any special tools and instruments required for maintenance & troubleshooting shall be arranged by the service provider without any extra cost to OIL. b) OIL's own existing workshop facility will be made available to SERVICE PROVIDER for carrying out the maintenance, repair, calibration & troubleshooting. In case any other W/S facility (in excess of that presently available with Oil India) is required, SERVICE PROVIDER shall arrange for the same.
11.9.4.4	<u>QUALITY OF SERVICE:</u>
a)	All instruments, equipment etc. proposed to be used under this AMC should be calibrated, and copies of all such certificates to be provided to OIL on demand. SERVICE PROVIDER shall ensure that such certificates remain valid for the duration of the AMC.
b)	Service provider shall carry out the maintenance as per the Original manufacturer recommendation.

c)	Reporting: The Service Provider shall provide the following reports to OIL, as per frequency indicated against each report / document:		
	Sl. No	Description of Reports	Frequency of reporting
	1	PM Schedule for all equipment of Casing running tool	Once, at the start of the contract.
	2	Maintenance Activity	Quarterly – 4 times, Half-yearly-2 times, Yearly- Once.
	3	Equipment Test/Calibration/Breakdown reports	Whenever equipment /Spares etc. are repaired/ replaced with new ones.
	4	Commissioning / Re-deployment report for all equipment under AMC.	At the beginning of every new location to be drilled.
d)	Safety: All safety procedures and guidelines are to be followed at all the time when in Drilling site. Providing proper safety appliances such as safety boots, helmets, hand gloves and protective clothing etc. to their personnel shall be Service Provider's responsibility.		
e)	Statutory Compliance: All relevant provisions of the following (or the latest amendments there to) shall comply by the Service Provider to this AMC, as well as personnel deployed- • OMR, 2017 • OISD standards • DGMS guidelines		

	• CPCB / APCB environment and anti-pollution guidelines • OIL Safety and Environment guidelines			
11.9.4.5	MANPOWER: The Service Team shall comprise of qualified and experienced service personnel as per following details.			
	Sl. No.	Purpose of visit	Service Team	
			Service Engineer	Technician
	1	Rig Move (Rig-up & Rig-down) Maintenance/Service job included	1 No.	1 No.
	2	Casing Running in operation (on call basis)	NIL	1 No.
a)	Service Engineer i. Should have a Degree preferably in Instrumentation/Electrical/Mechanical Engineering with a minimum of 3 years experience or Diploma preferably in Instrumentation/Electronics/Mechanical Engineering with a minimum of 5 yrs. experience as an Engineer in Diesel Electric (AC-VFD) drilling rigs. ii. Should have sound knowledge of Casing Running Tool& controls and have experience of carrying out maintenance of such systems. iii. Should be confident in independently carrying out troubleshooting, fault finding analysis, rectification of fault, configuration, operation and maintenance of all the items & field instruments/sensors of Centrifuge of (AC-VFD) drilling rigs. iv. Should be conversant with Oil Mines Regulations and OISD.			
b)	Technician: i) Must be diploma with minimum 3 yrs. Experience or ITI preferably in Instrumentation/Electrical/Mechanical with minimum 5 yrs. Experience respectively in the operation and maintenance of Casing Running Toolin diesel electric (AC-VFD) drilling rigs. ii) Should have sound knowledge of Casing Running Tool& controls.			

c)	Note: i) The service provider may deploy unskilled helper as and when required with prior permission from OIL. ii) An undertaking from Contractor's all personnel should be submitted to Company after deployment of manpower prior to commencement of work/completion of mobilization denouncing any claim on employment or any service benefit from OIL iii) The personnel deployed by the Contractor should comply with all the safety norms applicable during operation. iv) Medical Fitness: The Contractor shall ensure that all of the Contractor's Personnel shall have a full medical examination (by a qualified and registered doctor) prior to commencement of the Drilling operation and the certificates of all such personnel in form 'O' of The Mines Act 1952 should be submitted by the contractor.
d)	Training Courses: i) The Contractor shall ensure that all of the Contractor's Personnel performing services hereunder shall have attended all relevant safety and operational training courses such as Mines Vocational Training (MVT), First Aid Certificate course (FAC), Fire Fighting (FF), etc. required by "The Mines Act 1952" & "OISD Guidelines" and as is generally consistent with international petroleum industry practice and/or as otherwise required by the Company. ii) The Contractor shall submit copies of all such certificates prior to mobilization & also keep such records at well site.
e)	Approval Of Manpower: i) Contractor shall have to obtain prior approval from the Company before deployment of personnel in the rig. Applications seeking approval for deployment shall be submitted to GM- Drilling Operation and shall be forwarded to concerned department for scrutiny. ii) The following documents shall have to be submitted along with the letter seeking approval. a) Bio-data of the candidate with photograph. b) Photo copy of relevant pass certificates and other proficiency certificate c) Copy of experience certificates (original to be produced on demand). iii) Bidder shall furnish bio-data of key personnel with their photographs along with the techno-commercial bid of the AMC iv) The Company reserves the right to instruct the Service provider for removal of any Service provider's personnel who in the opinion of the Company is technically not competent or not rendering the services faithfully, or due to other reasons. However, the replacement personnel also must have the qualification/experience as indicated above. The Service provider should submit qualification/bio-data /photographs/experience/track record of the replacement personnel and obtain prior approval from the Company for their deployment. Replacement of personnel will be fully at the cost of the Contractor and shall be made by the Contractor within ten (10) days of such instruction.

11.9.5	<u>AMC- Electrical equipment of 5 nos. of 2000 HP VFD Rigs:</u>
11.9.5.1	<u>SCOPE OF WORK:</u> The scope of work for AMC in broad sense shall be periodic as well as breakdown maintenance of all the Electrical equipment of 5 nos. of 2000 HP VFD Rigs including the TOP Drive system but excluding Air Conditioning system. i) Onsite maintenance, troubleshooting & providing support services in keeping the complete rig Electrical system in operational and in good working condition. ii) The service provider shall have to arrange for the services required for their bought out items installed in the rig package. iii) Supervisory services will be required for rig-up, rig-down & inter-location movement in proper way. iv) The personnel(s) of the service provider should preferably be Indian citizens fully trained to provide the required services including hand-on training to OIL personnel under the AMC.
11.9.5.2	<u>RIG ELECTRICALS:</u>
A)	Scope: ON-SITE maintenance, troubleshooting and support service for the complete rig electrical system for the following but not limited to the following list of equipment /system: i) Rig control system (complete package including PLC/SBC/PAC system) ii) Top Drive System (Electrical equipment). iii) Rig alternators (Power Packs). iv) Alternator control system. v) Transformers. vi) DC bus sections (DC Power Distribution). vii) Rectifier sections.

	viii) Diode Supply Units. ix) HMI and Operating Console of Driller's Cabin. x) Electrical system of Hydraulic Control Station. xi) All Auxiliary AC motors and their associated starter/feeder panels (LT Power utilization & Distribution). xii) Soft starter panels including the soft starters and associated contactors/relays. xiii) Drilling motors (Mud Pump Motors, Draw Works Motors, IRD Motor, Auto Drill motors, Top drive motors and associated blower and lube motors). xiv) VFD / Inverter panels. xv) 600 VAC Power Distribution. xvi) Dynamic braking system including brake choppers and resistors. xvii) NGR System, including NGR Monitor, resistances and panel devices. - xviii) Socket Boards and connected switchgears. xix) LT distribution system and Lighting system which includes Mast Lighting system, Mud tank area lighting and Area Lighting system.
B)	Broad activities under Maintenance: Electrical maintenance activities outlined below covers the Electrical AMC in broad sense. Please note that these are minimum prescribed maintenance activities. All other activities (e.g. OEM recommended maintenance) under this AMC shall be in addition to these prescribed minimum activities. 1. Maintenance of items/systems/equipment / processes listed out under para A "Scope" above. This shall include periodic (quarterly, half yearly and yearly etc.) and breakdown maintenance services (on call basis).

	2. Maintenance of the rig control system including sub-systems, input/output modules, remote modules, re-programming or modification of the control system software as per drilling operational requirement etc. 3. Rectification of any problems, abnormalities, anomalies and defects noticed/logged during the course of a well operation at full/rated/part load. This will cover Troubleshooting & rectification/ replacement of defective parts/setting/adjustment/calibration of limits in the control system/ drives etc. 4. Supervisory services will be required during drilling operation, rig-up, rig-down & inter location movement in proper way. 5. Any other maintenance activity required for uninterrupted operation of the rigs.
C)	SPARES & CONSUMABLES: a) Bidder to recommend / offer spares for Four (04) years of normal operation of all equipment / system in the offer indicating item, part no. & quantity required. Item wise price of such spares should also be provided in commercial bid (price bid). Bidder should indicate the part nos. against each item along with OEM's part no. if any. The cost of these spares will NOT be considered for price comparison. The price of such spares shall not be revised for next Five (05) years from the date of commissioning of first lot of rigs and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years. b) Replaced defective spares, if any shall be deposited to Oil India Limited.
D)	Tools / Tackles & Workshop Facilities: 1. The Service Provider shall arrange for all the tools & tackles and instruments for carrying out the maintenance & troubleshooting of the Electrical system. Any special tools and instruments required for maintenance & troubleshooting of Electrical system shall be arranged by the service provider without any extra cost to OIL. 2. Oil India will only provide facility for lifting / handling / carrying heavy equipment. 3. OIL's own existing workshop facility (presently available at the Rig) will be made available to SERVICE PROVIDER for carrying out the maintenance & trouble shooting. In case any other W/S facility (in excess of that presently available with Oil India) is required, SERVICE PROVIDER shall arrange for the same.

E)	Reports: SERVICE PROVIDER shall provide the following reports to OIL, as per frequency indicated against each report / document:		
	Sl. No	Description of Reports	Frequency of reporting
	1	PM Schedule for all equipment covered under Para "11.10.6.2 A SCOPE " above	Once, at the start of the contract.
	2	Maintenance Activity	Quarterly – 4 times, Half-yearly-2 times, Yearly- Once.
	3	Drawing Changes or alterations changes made to circuits, equipment with approval from OEM.	As and when such occur.
	4	Equipment Test reports	Whenever equipment /Spares etc. are replaced with new ones.
	5	Commissioning / Re-deployment	At the beginning of every new location to be drilled

		report for all equipment under AMC	
F)	Quality of maintenance: 1. All instruments, equipment etc. proposed to be used under this AMC should be calibrated, and copies of all such certificates to be provided to OIL on demand. SERVICE PROVIDER shall ensure that such certificates remain valid for the duration of the AMC. 2. In case any cable / wires are replaced, its original ID tag should be restored. 3. No safety device / provision should be by-passed or jumpered. In case such action is absolutely necessary, it shall be removed as soon as the situation has been normalized. 4. Service provider shall carry out the maintenance as per the Original manufacturer recommendation. 5. Frequent break down /poor performance of the machine shall be analyzed by qualified /expert /competent engineer without any extra cost to OIL.		
G	Safety during carrying out maintenance activities: Contractor shall ensure that a system of Electrical shutdown permit (permit to carry out Electrical work), hot work/cold work permit is employed as required. 1. Statutory provisions: All relevant provisions of the following (or the latest amendments there to) shall apply to this AMC, as well as personnel deployed under this AMC: i) CEA (Measures relating to safety and electric supply) regulations, 2010 ii) OMR, 2017 iii) OISD standards		

	iv) DGMS guidelines v) CPCB / APCB environment and anti-pollution guidelines vi) OIL Safety and Environment guidelines Contractor should ensure that all his personnel, deployed under this contract are familiar with all relevant provisions of the above. 2. Providing proper safety appliances such as safety boots, helmets, hand gloves and protective clothing etc. to their personnel shall be Service Provider's responsibility.			
H)	<u>Special Provisions:</u> This AMC shall also cover maintenance of systems/equipment newly added or replaced during operational or statutory requirements.			
I)	<u>Personnel to be deployed :</u>			
1	SERVICE PROVIDER shall provide personnel for maintenance, troubleshooting & providing support services in keeping the complete rig packages in good health.			
2	All necessary trained man power required under the AMC shall have to be arranged by the service provider. OIL will only provide support staff for rig up/rig down of the equipment as and when required.			
3	The Service Team shall comprise of qualified and experienced service personnel as per following details.			
	Sl. No.	Purpose of visit	Service Team	
			Service Engineer	Technician
	1	Rig Move (Rig-up & Rig-down)	1 No.	1 No.
	2	Quarterly Maintenance	1 No.	1 No.
	3	Half-yearly Maintenance	1 No.	1 No.

	4	Yearly Maintenance	1 No.	1 No.
	5	Troubleshooting (On call basis)	As per requirement (To be decided depending on the nature of repair work)	As per requirement (To be decided depending on the nature of repair work)
4	<u>ELECTRICAL ENGINEER:</u> i) Should have a Degree in Electrical Engineering with a minimum of 3 years experience or Diploma in Electrical Engineering with a minimum of 5 yrs. experience as an Engineer in Diesel Electric (AC-VFD) drilling rigs. ii) Should have experience of carrying out maintenance of Low Voltage Drives and PLC/SBC/PAC. iii) Should be confident in independently carrying out the fault finding analysis, rectification of fault, operation and maintenance of all the electrical items of diesel electric (AC-VFD) drilling rigs including air conditioners. iv) Must possess valid Electrical Supervisor's Certificate of Competency No 1, 2, 3, 4 & 8 (Mining Part) issued by State Licensing Board and should be conversant with Oil Mines Regulations and Electricity rules. v) Validity of permits – All persons working on electrical systems under this contract should have valid supervisor / workmen permits, allowing them to work in the state / region where they are deployed. Responsibility for ensuring adherence to these norms rests with the contractor. vi) ITI certificate holders are not acceptable as Electrical Engineer. Moreover, the Electrical Engineer must be conversant with the AC-VFD system of drilling rigs.			

5	<u>ELECTRICIAN:</u> i) Must be diploma with minimum 3 yrs. Experience or ITI in Electrical discipline with minimum 8 yrs. Experience respectively in the operation and maintenance of diesel electric (AC-VFD) drilling rigs. ii) Should be able to read circuits, communicate, detect and rectify faults. iii) Must possess valid Electrical Work Permit 1 & 2 Certificate of competency issued by State Licensing Board.
6	The personnel shall be fully conversant with the complete system of rig electricals as well as the VFD rig control system.
7	The person should be physically fit for working in the well-site. They shall also be able to work with their own hands.
8	The person(s) shall also be able to communicate in English (without the services of an interpreter).
9	NOTE: a) An undertaking from Contractor's all personnel should be submitted to Company after deployment of manpower prior to commencement of work/completion of mobilization, denouncing any claim on employment or any service benefit from OIL. b) The personnel deployed by the Contractor should comply with all the safety norms applicable during operation. c) Medical Fitness: The Contractor shall ensure that all of the Contractor's Personnel shall have a full medical examination (by a qualified and registered doctor) prior to commencement of the Drilling operation and the certificates of all such personnel in form 'O' of The Mines Act 1952 should be submitted by the contractor. d) Training Courses: i) The Contractor shall ensure that all of the Contractor's Personnel performing services hereunder shall have attended all relevant safety and operational training courses such as Mines Vocational Training (MVT), First Aid Certificate course (FAC), Fire Fighting (FF), etc. required by "The Mines Act 1952" & "OISD Guidelines" and as is generally consistent with international petroleum industry practice and/or as otherwise required by the Company. ii) The Contractor shall submit copies of all such certificates prior to mobilization & also keep such records at well site for the

	e) The service provider may deploy unskilled Electrical helper as and when required with prior permission from OIL.
F)	APPROVAL OF MANPOWER: Contractor shall have to obtain prior approval from the Company before deployment of personnel in the rig. Applications seeking approval for deployment shall be submitted to CGM-Drilling-Operation and shall be forwarded to concerned department for scrutiny. The following documents shall have to be submitted along with the letter seeking approval. i. Bio-data of the candidate with photograph. ii. Photo copy of relevant pass certificates and other proficiency certificate iii. Copy of experience certificates (original to be produced on demand). iv) Bidder shall furnish bio-data of key personnel with their photographs along with the techno-commercial bid v) The Company reserves the right to instruct the Service provider for removal of any Service provider's personnel who in the opinion of the Company is technically not competent or not rendering the services faithfully, or due to other reasons. However, the replacement personnel also must have the qualification/experience as indicated above. The Service provider should submit qualification/bio-data/photographs/experience/track record of the replacement personnel and obtain prior approval from the Company for their deployment. Replacement of personnel will be fully at the cost of the Contractor and shall be made by the Contractor within ten (10) days of such instruction. The supplier of the Rigs shall provide Annual Maintenance Contract (AMC) with Oil India Limited, for four (4) years (after completion of warranty period) ON-SITE maintenance, troubleshooting and support service for the complete rig instrumentation and control systems of the supplied Rig.
11.9.6	<u>AMC-RIG INSTRUMENTATION:</u>
11.9.6.1	<u>SCOPE OF WORK:</u> ON-SITE maintenance, troubleshooting and support service for the complete rig instrumentation and control systems of all field sensors to the respective controllers, which includes but not limited to the following systems: Advanced Drilling Instrumentation system, Draw works, TDS, MUD Pump, Auxiliary - Iron rough Neck, Hydraulic Cat Walk, HPU, H-Manifold, Hydraulic Cat-Head & Centrifuge. The following points shall be considered for the AMC for rig instrumentation: a) Supervisory services for maintenance, troubleshooting & providing support services in keeping the complete rig packages in good health. b) Maintenance of the rig instrumentation & control system including sub-systems, input/output modules, remote modules, re-programming or modification of the control system software as per drilling requirement etc.

	c) Familiarizing the instrumentation crew with the above mentioned equipment/systems and imparting hands-on training for basic troubleshooting and maintenance. d) Rectification of any problems, abnormalities, anomalies and defects noticed/logged during the course of a well, so that there shall be uninterrupted drilling activity. e) Preparation of inventory and spares list. f) The service provider shall have to do maintenance of the bought out items also installed in the rig package or arrange for the services required from the OEM of such items. g) The service provider shall arrange for hiring / summoning the services of technical experts in case site engineer is unable to rectify/ troubleshoot a particular problem, at no extra cost to OIL. h) In case any defect or functional anomaly is noticed/predicted during any maintenance activity, or pointed out by Oil India, SERVICE PROVIDER shall rectify the same to the complete satisfaction of Oil India. i) The AMC shall also cover maintenance of systems/equipment newly added or replaced during operational or statutory requirements. j) Supervisory services shall be provided during rig-up, rig-down & inter location movement in proper way whenever asked for. k) The scope of AMC for instrumentation items should include the complete instrumentation and control system. l) The spares required for maintenance will either be provided by OIL or will be procured (if required urgently) from the service provider. m) List of all spares required for maintenance of instrumentation and control system along with price shall be provided by the supplier and the same shall be provided upon delivery. n) For maintenance and troubleshooting of rig instrumentation & controls one qualified expert Instrumentation Engineer (Educational Qualification: BE) of minimum 2 years' experience in the relevant field shall be employed. o) The maintenance package shall include services of one the instrumentation engineer along with provision of all special tools, tackles instruments and calibrators. p) The person shall be fully conversant with the complete system of rig instrumentation & control system. He should be physically fit for working in the well site. He shall also be able to work with his own hands. q) The manpower & tools including OIL's own workshop facility required for carrying out the maintenance & trouble shooting will be made available by OIL. r) The personnel(s) of service provider should preferably be Indian citizens and fully trained by service provider to carry out the AMC. s) Accommodation, food, boarding & lodging will NOT be provided by OIL and that is the service provider's scope.
11.9.6.2	SPARES & CONSUMABLES: a) Bidder to recommend/offer spares for Four (04) years of normal operation of all equipment / system in the offer indicating item, part no. & quantity required. Item wise price of such spares should also be provided in commercial bid (price bid). Bidder should indicate the part nos. against each item along with OEM's part no. if any. The cost of these spares will NOT be considered for price comparison. The price of such spares shall not be revised for next Five (05) years from the date of commissioning of first lot of rigs and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years. b) Replaced defective spares, if any shall be deposited to Oil India Limited.

11.9.6.3	<u>SPECIAL TOOLS/CALIBRATORS:</u> The Service Provider shall arrange for all the tools & tackles and instruments for carrying out the maintenance & troubleshooting of the Instrumentation & Control system. Any special tools and instruments required for maintenance & troubleshooting of Instrumentation & Control system shall be arranged by the service provider without any extra cost to OIL. 1. OIL's own existing workshop facility will be made available to SERVICE PROVIDER for carrying out the maintenance, repair, calibration & trouble shooting. In case any other W/S facility (in excess of that presently available with Oil India) is required, SERVICE PROVIDER shall arrange for the same.		
11.9.6.4	<u>QUALITY OF SERVICE:</u>		
a)	All instruments, equipment etc. proposed to be used under this AMC should be calibrated, and copies of all such certificates to be provided to OIL on demand. SERVICE PROVIDER shall ensure that such certificates remain valid for the duration of the AMC.		
b)	Service provider shall carry out the maintenance as per the Original manufacturer recommendation.		
c)	Reporting: The Service Provider shall provide the following reports to OIL, as per frequency indicated against each report / document:		
	Sl. No	Description of Reports	Frequency of reporting
	1	PM Schedule for all equipment covered under Para "11.9.7.1 SCOPE OF WORK" above	Once, at the start of the contract,
	2	Maintenance Activity	Quarterly – 4 times, Half-yearly-2 times, Yearly- Once.
	3	Drawing Changes or	As and when such occur

		alterations changes made to circuits, equipment with approval from OEM.	
	4	Equipment Test/Calibration /Breakdown reports	Whenever equipment /Spares etc. are repaired/ replaced with new ones.
	5	Commissioning / Re- deployment report for all equipment under AMC	At the beginning of every new location to be drilled
d)	Safety: All safety procedures and guidelines are to be followed at all the time when in Drilling site. Providing proper safety appliances such as safety boots, helmets, hand gloves and protective clothing etc. to their personnel shall be Service Provider's responsibility.		
e)	Statutory Compliance: All relevant provisions of the following (or the latest amendments there to) shall comply by the Service Provider to this AMC, as well as personnel deployed- • OMR, 2017 • OISD standards • DGMS guidelines • CPCB / APCB environment and anti-pollution guidelines • OIL Safety and Environment guidelines		
11.9.6.5	<u>MANPOWER:</u>		
1	The Service Team shall comprise of qualified and experienced service personnel as per following details:		

	Sl. No.	Purpose of visit	Service Team	
			Service Engineer	Technician
	1	Rig Move (Rig-up & Rig-down)	1 No.	1 No.
	2	Quarterly Maintenance	1 No.	1 No.
	3	Half-yearly Maintenance	1 No.	1 No.
	4	Yearly Maintenance	1 No.	1 No.
	5	Troubleshooting (On call basis)	As per requirement (To be decided depending on the nature of repair work)	As per requirement (To be decided depending on the nature of repair work)
2	Instrumentation Engineer: a) Should have a Degree in Instrumentation/Electronics Engineering with a minimum of 3 years experience or Diploma in Instrumentation/Electronics Engineering with a minimum of 5 yrs. experience as an Engineer in Diesel Electric (AC-VFD) drilling rigs. b) Should have sound knowledge of PLC/SBC/other control systems and have experience of carrying out maintenance of such systems. c) Should be confident in independently carrying out troubleshooting, fault finding analysis, rectification of fault, configuration, operation and maintenance of all the instrumentation items & field instruments/sensors of diesel electric (AC-VFD) drilling rigs. d) Should be conversant with Oil Mines Regulations and OISD.			
3	Instrumentation Technician: i) Must be diploma with minimum 3 yrs. Experience or ITI in Instrumentation/Electronics with minimum 5 yrs. Experience respectively in the operation and maintenance of diesel electric (AC-VFD) drilling rigs. ii) Should be able to read circuits, communicate, detect and rectify faults.			

4	Note: i) The service provider may deploy unskilled helper as and when required with prior permission from OIL. ii) An undertaking from Contractor's all personnel should be submitted to Company after deployment of manpower prior to commencement of work/completion of mobilization, denouncing any claim on employment or any service benefit from OIL iii) The personnel deployed by the Contractor should comply with all the safety norms applicable during operation. iv) Medical Fitness: The Contractor shall ensure that all of the Contractor's Personnel shall have a full medical examination (by a qualified and registered doctor) prior to commencement of the Drilling operation and the certificates of all such personnel in form 'O' of The Mines Act 1952 should be submitted by the contractor.
5	Training Courses: i) The Contractor shall ensure that all of the Contractor's Personnel performing services hereunder shall have attended all relevant safety and operational training courses such as Mines Vocational Training (MVT), First Aid Certificate course (FAC), Fire Fighting (FF), etc. required by "The Mines Act 1952" & "OISD Guidelines" and as is generally consistent with international petroleum industry practice and/or as otherwise required by the Company. ii) The Contractor shall submit copies of all such certificates prior to mobilization & also keep such records at well site for the
6	Approval Of Manpower: i) Contractor shall have to obtain prior approval from the Company before deployment of personnel in the rig. Applications seeking approval deployment. All applications shall be submitted to CGM- Drilling Operation and shall be forwarded to concerned department for scrutiny. ii) The following documents shall have to be submitted along with the letter seeking approval. a) Bio-data of the candidate with photograph. b) Photo copy of relevant pass certificates and other proficiency certificate c) Copy of experience certificates (original to be produced on demand). iii) Bidder shall furnish bio-data of key personnel with their photographs along with the techno-commercial bid of the AMC iv) The Company reserves the right to instruct the Service provider for removal of any Service provider's personnel who in the opinion of the Company is technically not competent or not rendering the services faithfully, or due to other reasons. However, the replacement personnel also must have the qualification/experience as indicated above. The Service provider should submit qualification/bio-data /photographs/experience/track record of the replacement personnel and obtain prior approval from the Company for their deployment. Replacement of personnel will be fully at the cost of the Contractor and shall be made by the Contractor within ten (10) days of such instruction.

11.10	<u>PRE-DESPATCH INSPECTION:</u> Complete package of drilling rig (with all accessories) after assembling & testing should be offered for inspection & functional testing at Rig Package Integrator's yard by OIL's team (comprising of engineers from Drilling, Rig building, Technical Services, Materials, Instrumentation, Logistics & Electrical) prior to dispatch with at least two months' notice. Cost of travel, accommodation and other expenses of OIL's PDI team will be borne by OIL. Bidder should indicate their acceptance in the technical bid. Bidders to note that pre dispatch inspection will be carried out by OIL only after receipt of final report from the Third Party Inspection & Certifying Authority (TPICA). The Inspection cum Acceptance process would include but not limited to the following minimum steps/tasks: i) Physical verification/inspection of all the items/fittings/accessories including all Parts Catalogue, Maintenance & Service Manuals, Schematics, all tools under complete tool kit as well as other tools, all spares as per the Spare Parts List, etc. ii) Operational / functional testing of the Power Packs, Draw-works, Top Drive, Iron Roughneck, Electric & Lighting system, Mud Pumps, Air Compressors, Rig-up & Rig-down sequence, etc. iii) Supplier shall have to take note of any minor modification(s) for operational requirement suggested by the inspection team and comply with the same at no extra cost. iv) The minutes of inspection process would be prepared at the end of the inspection and jointly signed by all parties. v) Supplier shall confirm in writing compliance of all the points raised in the minutes of inspection as well as any other subsequent additions/changes, following deliberation with the inspector. vi) Supplier will affect dispatch of the unit only on receipt of OIL's dispatch advice. vii) Any other testing / joint inspection indicated elsewhere in this tender.
11.11	<u>DELIVERY OF RIG PACKAGE:</u> Please refer BEC/BRC for Delivery of Rig package.

11.12	<u>MAKE OF RIG ACCESSORIES:</u> Make of rig accessories for supply with rig package should be as per the undernoted preferred options:		
	Sl. No.	Equipment / Item	Make / Name of Vendor
	1	Hydraulic Cylinder	Maritime Hydraulics
			HSI Corporation
			Hydratech Industries
			Ram Industries Inc.
			Hyco
			Hydrofit
			NOV
	2	Travelling Block	National Oilwell Varco
			American Block Company
			Bharat Heavy Electricals Ltd.
			Drillmec SpA
	3	Deadline Anchor	Dreco Enery Services
			National Oilwell Varco

	4	Elevator link	National Oilwell Varco-Varco BJ
			Forum Blohm+Voss Oil Tools GmbH/BVOT
	5	Rotary Table	American Block Company
			Bharat Heavy Electricals Ltd
			Drillmec S.p.A.
			Hackers Industries
			National Oilwell Varco
	6	Master bushing	National Oilwell Varco
			Forum Blohm+Voss Oil Tools GmbH/BVOT
			Forum Energy Technologies
			Den-Con Tool Company Ltd.
	7	Power Slips (Hydraulic) / Rotary Slip (Hydraulic)	National Oilwell Varco
			Blohm+Voss Oil Tools GmbH/BVOT
			Forum Energy Technologies
			Den-Con Tool Company Ltd.
	8	Casing / Drilling Line	Bridon American Corp.
			Usha Martin Limited.

			Wire Rope Corporation of America Inc.
	9	Rotary Hose	Dunlop Argentina
			Phoenix Beattle
			Contitech Rubber Industrial Ltd.
			Gates Corporation
	10	High Pressure Mud Hose (Vibratory)	Gates Corporation / Iola Facility
			Contitech Rubber Industrial Ltd.
			Dunlop Argentina S.A.
	11	Hydraulic cathead	National Oilwell Varco
			MH Wirth
			SMF
	12	Disc Brake (Auxiliary Draw-works Brake)	Eaton Corporation
			National Oilwell Varco
			Wichita Clutch
	13	Shale Shakers, LMMC, Centrifuge	Derrick Equipment Co.
			National Oilwell Varco
			MI Swaco

	14	Degasser	Derrick Equipment Co.
			National Oilwell Varco
			MI Swaco
			BHEL
	15	Jet Shearing Device	Derrick Equipment Co.
			Flow Process Tech
			Gaurav Associates
	16	Pneumatic Winches	Ingersoll Rand
			Braden
			JDN Nehaus Ltd.
			EMCE Winches
	17	High Pressure Gauges	Cameron Instruments
			National Oilwell Varco
			Oteco Inc.
			Wagner Instruments
	18	Iron Roughneck	National Oilwell Varco
			Weatherford

			Forum Blohm+Voss Oil Tools GmbH/BVOT
	19	Advanced Instrumentation & Sensors	National Oilwell Varco
	20	Casing Running Tool	National Oilwell Varco
			Baker Hughes
			Tesco
			Weatherford
	21	Air Compressor	Sullair
			Ingersoll Rand
			Elgi
			Chicago Pneumatic
			Kaeser Kompressoren
			Atlas Copco
	22	Power Pack Engine	Caterpillar (Alternative makes not acceptable)
	23	250-KVA, DG Set	Caterpillar
			Cummins

			Jackson
			Sudhir Power Ltd
			Powerica Ltd
			Mahindra Powerol
			Kirloskar Oil Engines Limited
			Greaves Ltd
	24	Mud Pump	Garden Denver
			National Oilwell Varco
			Mh Wirth
			DrillMec
	25	Centrifugal Pumps	National Oilwell Varco
			Adroit
			Jee Pumps PVT Ltd
			Harrisburg
			SPD Baker
			Mud Hog
	26		Oteco Inc.

		HP Valves & fittings	MCM O" Drill
			Demco (Cameron)
	27	Alternator	Kato (Nidec Motor Corporation)
			BHEL
			CAT
			General Electric
	28	AC VFD drilling motor (Except Top Drive AC VFD Motor)	General Electric (Wabtec)
			ABB
			Bentec
			NOV
	29	VFD panels (including convertor)	ABB
			Siemens
			Rig OEM own make
Note	Criteria for selection of manufacturers for bought out items: Items at Sl. No. 1 to 21 and 23 to 29 are to be supplied from above preferred vendors OR alternately in compliance to evaluation criteria as per BEC Clause A.1.2.3.		

	SECTION-12: GENERAL TOOLS
12	GENERAL TOOLS: BIDDER TO CONFIRM (All tools mentioned under this section are mandatory tools which should be included for supply. Prices indicated under mandatory tools will be considered for evaluation) a) Accepted Make (Where ever Applicable): GRIPHOLD/ SNAP ON/LEATHER MAN/PROTO / MEKASTER / STANLEY / TAPARIA b) Accepted Make for Electrical / Instrumentation tools (Where ever Applicable): Fluke / Megger / Hioki / Tecktronix / Philips / Yokogawa.
12.1	<u>MECHANICAL TOOLS: BIDDER TO CONFIRM:</u> Refer Section 5.1.7
12.2.a	<u>DRILLING TOOLS: BIDDER TO CONFIRM</u> 1. 2 Sets of open end and Ring hammer wrench- Non Sparking (32 to 90 mm) 2. 2 nos. each of 8, 12 & 16lbs Brass Hammer- Non Sparking 3. 4 Nos. of 20 lbs Hammer 4. 6 Nos. each of 8, 12 & 16lbs Hammer 5. 6 Sets of OPEN JAW DOUBLE ENDED SPANNER, SIZES (in MM): 16- 32, 6. 6 Sets of DOUBLE ENDED RING SPANNER, SIZES (in MM): 66 - 32, 7. Digital Vernier Calliper. 8. Inside & Outside Calliper. 9. Laser Measurement Tool (approx. 20 m) 10. 15 Meters Steel Tape (2 Nos.)
12.2.b	<u>RIG BUILDING TOOLS: BIDDER TO CONFIRM</u> 1. 2 Sets of open end and Ring hammer wrench- Non Sparking (32 to 90 mm) 2. 2 nos. each of 8, 12 & 16lbs Brass Hammer- Non Sparking 3. 4 Nos. of 20 lbs Hammer

	4. 6 Nos. each of 8, 12 & 16lbs Hammer 5. 6 Sets of OPEN JAW DOUBLE ENDED SPANNER, SIZES (in MM): 16- 32, 6. 6 Sets of DOUBLE ENDED RING SPANNER, SIZES (in MM): 66 - 32, 7. Digital Vernier Calliper. 8. Inside & Outside Calliper. 9. Laser Measurement Tool (approx. 20 m) 10. 15 Meters Steel Tape (2 Nos.) 11. Torque wrench (max 500Nm) 12. 2 Box wrench set 8mm to 32mm per rig 13. 2 ratchet screw driver set per rig 14. Bench vice set 1per rig (8 inch jaw) 15. Snap –ring plier 1 per rig 16. 2 adjustable wrench set (minimum 6 pcs per set) per rig 17. 2 Allen wrench set (0.5mm to 32mm) & (1/16" to 1") 2 set/rig 18. Hacksaw blade with frame 3 set/rig 19. Ball pin hammer 3/rig 20. San angelo bar 3/rig 21. Extractor screw set 22. Hand held drill machine 1/rig 23. Hand held portable grinder 1/rig 24. Pneumatic bucket grease gun (25kg) 25. Portable Hand grease gun		
12.3	<u>INSTRUMENTATION TOOLS: (BIDDER TO CONFIRM)</u> 6 (six) sets of tool kit shall be provided by the supplier. Each set of tool kit for every Rig and 1 (one) set of tool kit to be submitted at Instrumentation Office. Each Tool kit should comprise of one (01) of following instruments:		
	Sl. No.	Item	Qty.
	1	Sets of Socket in ½" Sq. ,	01 set

		Drive Size (in Inches): 3/8" to 2	
	2	Digital Multimeter, Fluke	01 No
	3	Special Tools for Maintenance of VFD house	01 set
	4	Soldering Iron kit 35 watt	01 No
	5	Soldering Iron Kit 65 Watt	01 No
	6	Disoldering End	01 No
	7	Hand Drill Machine portable	01 No
	8	Hand Crimping Tool 6 mm2-70mm2 with die	01 set
	9	Special Crimping Tool with inseration kit for multicore control cable	01 No
	10	Ring Spanner 6-36 mm	01 set
	11	Open end Spanner 6-36 mm	01 set

	12	Box Spanner with Ratchet	01 set
	13	Tubular spanner 10-20 mm	01 set
	14	Allen Key 1.5-10mm	01 set
	15	Torx Wrench	01 set
	16	Adjustable wrench 6"	01 set
	17	Adjustable wrench 12"	01 set
	18	Cutting Pliers	01 no
	19	Nose Pliers	01 no
	20	Wire Strippers 1.5-10 mm	01 No
	21	Cable cutter upto cable size 400 mm ²	01 no
	22	Combination Plier with insulation hand	01 No
	23	Testers	01 No
	24	Precision Screw Driver	01 set
	25	Screw Driver 6"	01 No
	26	Screw Driver 12"	01 No

	27	Screw Driver Philips Pattern	01 set
	28	Ball Peen Hammer ½ KG	01 No
	29	Ball Peen Hammer 1 KG	01 No
	30	Measuring Tapes 5 m	01 No
	31	Hack Saw	01 No
	32	Needle Files	01 No
	33	Flat Files 12" Fine & Coarse	01 No
	34	Round File 12" Fine & Coarse	01 No
	35	Half Round File 12" Fine & Coarse	01 No
	36	Scissors heavy duty	01 No
	37	Tool Bag lightweight & heavy duty	01 No
12.4	<u>ELECTRICAL TOOLS: BIDDER TO CONFIRM:</u> Refer to section 9.10.4 of electrical specifications.		

	SECTION-13: EQUIPMENT/CONSUMABLES SOBM
13.1	All the rubber parts of the mud pump, centrifugal pumps are to be compatible to the SOBM base oil and SOBM at the surface mud tank temperature.
13.2	All the rubber parts of valves (high pressure line), choke manifold, kill line, trip tank valves are to be compatible to the SOBM base oil and SOBM at the surface mud tank temperature
13.3	All the rubber parts of the valves in the mud tank area including shale shakers, de-sander, desilter, degasser mud cleaners, isolation valves in tanks, hopper valves are to be compatible to the SOBM base oil and SOBM at the surface mud tank temperature
13.4	All the rubber parts of the ,Top drive system, rotary hose etc. are to be compatible to the SOBM base oil and SOBM at the surface mud tank temperature
13.5	The Rig is to have Sheer thinning device attached at the hopper for preparation of SOBM at the rig, maintenance of SOBM during the well operation.
13.6	The Rig is to have provision to receive and deliver SOBM base oil and SOBM from the rig and to the rig.
13.7	The rig has to have company standard SOBM base oil storage facility at the rig of capacity–75 m3
13.8	The rig should have facility and arrangement to cover the Mud Tank area, covering from hopper area to trip tank area including shale shaker tank, as well as to the mud ditches and in the mud tank areas, and centrifugal pump areas.
13.9	The Rig has to have a SOBM collection system at the rig floor and at the riser level to collect and transfer the SOBM to the mud tanks system. A mud box with a return line to the mud pit is to be provided. A catch pan installed on top of the bell nipple to catch spills from the drill string is also to be provided. The pan should extend beyond the edges of the table.
13.10	The rig floor is to be provided with anti-skid mat flooring to avoid mishaps due to slipping
13.11	The Rig is to be equipped with external and internal drill pipe wiper to reduce spillage, wastage of SOBM
13.12	The rig is to have double diaphragm pump to suck SOBM from pits, sink area.
13.13	The Rig has to do away from the water-cooling system of Mud pumps and have a closed loop cooling system, leak proof, in accordance to industry standards.
13.14	The rig is to have mud saver sub to save as much SOBM on each connection.

13.15	A racking pan of the drill pipe and drill collars that drain to the flow line is also to be provided.
13.16	A premix tank of at least 100bbl capacity to prepare pills &mix some additives
13.17	The rig is to provide vacuum system to clean up spills
13.18	Steam cleaners for cleaning up after spills and routine cleaning of rigs
13.19	The Shale shaker should be equipped with screens to utilize75% of the screen area.
13.20	The rig is to provide an oil or a Base oil sprayer to wash the shale shaker screen
14	TRAINING: Scope of Work: The successful bidder shall impart training to OIL personnel comprising Engineers, Supervisors, and Technicians & Mechanics through a structured training program. The program shall consist of classroom training, simulator training, onsite training and also hands on training. Special emphasis shall be given to the various interlinkages between systems, their trouble shooting and remedies. The training shall include but not limited to the following:
1	Training:
1.1	The supplier shall arrange for comprehensive training program before dispatch of Rig (preferably immediately after the pre-dispatch inspection by Third party inspectors and/or OIL personnel)
1.2	Bidders are required to submit detailed training module clearly defining the scope, location and duration of the training along with the bid. In case Rig Supplier doesn't have the training facilities for major bought-out equipment, the supplier shall arrange these training in consultation with/ through the respective OEM.
1.3	Non-compliance may lead to rejection of the bid
1.4	The training module shall cover the following training as mentioned in Table below.

1.5	The training for the rig personnel of different discipline/trade, shall include but not be limited to the following:	
1.5.1	Comprehensive training at OEM / Rig Package Integrator facility: Operation (including simulator training) Maintenance, Troubleshooting & Working Principle. Rig personnel will undergo comprehensive training at OEM / Rig Package Integrator premises for Engineers in three batches. Each batch shall consist of following rig personnel total 39 No (13x3). The candidate profile is outlined in sections 1.6.1 thru 1.6.4	
1.5.1.1	Duration	15 working Days
1.5.1.2	Venue	OEM works
1.5.1.3	Drilling Engineer	04 (Four)
1.5.1.4	Drilling – TS (Engineer)	02 (Two)
1.5.1.5	Electrical Engineer	03 (Three)
1.5.1.6	Instrumentation Engineer	01 (one)
1.5.1.7	Rig Building engineer & supervisor	03(Two)
1.6	The training module designed by the OEM for the rig personnel of different discipline/trade shall include but not be limited to the following:	
1.6.1	Candidate: Drilling /Rig building engineers:	
1.6.1.1	Various controls &operation (including simulator training)	
1.6.1.2	Mud pump, Centrifuge, Rig Hydraulic, Hydraulic cylinders, hydraulic cat walk and Mud system	
1.6.1.3	Top Drive &controls	
1.6.1.4	Draw-works, Iron Rough Neck, Casing running tool	
1.6.1.5	BOP Cart	
1.6.1.6	Safety features familiarization	

1.6.1.7	Rig assembling & dismantling
1.6.1.8	Rig raising and lowering mechanism & engineering. Drilling load distribution in individual parts (structural engineering)
1.6.2	Candidate: Mechanical Maintenance Engineers
1.6.2.1	Operation and advanced maintenance & trouble shooting (including simulator)
1.6.2.2	Power Packs & Generating Set Engine systems including their adjustments
1.6.2.3	Mud system including, centrifuge & Mud pumps. Air system & air compressor. Centrifugal Pumps and their maintenance. The training shall focus on system interlinkages, control systems, trouble shooting and remedies.
1.6.3	Candidate: Instrumentation Engineers / Inst. Crew
1.6.3.1	Theory of Rig Instrumentation System and application of the same in drilling rigs Operation and advanced maintenance & troubleshooting (including simulator)
1.6.3.2	Maintenance and troubleshooting of Integrated Rig control system Electronic digital monitoring system, Rig sense or equivalent system for complete range of technical parameter
1.6.3.3	Maintenance and troubleshooting of Drawworks Control system Sensor calibration & maintenance
1.6.3.4	Maintenance and troubleshooting of TDS Control System Report generation, printing & documentation. Instrumentation for auxiliary equipment
1.6.3.5	Maintenance and troubleshooting of Mud Pump Control Training on software for programming & trouble shooting of drilling instrumentation / Control system
1.6.3.6	Maintenance and troubleshooting of auxiliary controls of the rig such as Iron rough Neck, casing running tool, Hydraulic Cat Walk, HPU, H-Manifold, Hydraulic Cat Head.
1.6.3.7	Maintenance and troubleshooting of Intercom/PA system
1.6.3.8	Maintenance and troubleshooting of CCTV system
1.6.4	Candidate: Electrical Engineers / Electrical crews

1.6.4.1	Operation and advanced maintenance & troubleshooting (including simulator)
1.6.4.2	Generating sets Power Control Power distribution VFD Control training
1.6.4.3	VFD House, ACPCR (MCC), TDS, Alternators, HVAC, Drilling Motors, Compressors
1.6.4.4	Control System and related Software
1.6.4.5	Rig assembling & dismantling
1.6.4.6	Basic training for the electrical crew about the theory of AC drive technology and application of the same in drilling rigs.
1.6.4.7	Maintenance and troubleshooting of AC drives (for the particular model of AC drive fitted in the rig) including converter panels and DC link for electrical engineers/crew. (Basic/ Intermediate/ Advanced level)
1.6.4.8	Rig control system for Elect. Engineer. (Basic/ Intermediate/ Advanced level)
1.6.4.9	Maintenance & overhauling of Generators and AC drilling motors. .(Basic/ Intermediate/ Advanced level)
1.6.4.10	Maintenance and troubleshooting of electrical top drive system including motors. (Basic/ Intermediate/ Advanced level)
1.7	Training Module for Supervisor / Technician / Mechanics/ onsite crews. The modules as outlined shall be designed to impart training for Sections 1.7 thru 1.10 Rig operation and maintenance of equipment (OEM training facility in India) in two batches. Candidate: Drilling operation Crews/Chemical crew
1.7.1	This training module shall be developed for OIL employees to familiarize them with various activities and operations during drilling of well.
1.7.2	The personnel trained shall be able to operate and maintain all the pipe handling equipment like hydraulic cat walk, hydraulic power slipsand iron roughneck.
1.7.3	The BOP cart system, TDS, Mud handling equipment etc. shall also be covered in the training module.
1.7.4	In case Rig Supplier doesn't have the training facilities for major bought-out equipment, the supplier shall arrange these training in consultation with/ through the respective OEM

1.7.5	Operation of mud mix assembly, tank valve system, mud movement through different tanks, solid control equipment including centrifuge etc.				
1.8	Breakdown, advance maintenance and troubleshooting training (OEM training facility in India) in two batches Candidate: Drilling, Rig building, Mechanical Maintenance, Electrical and Instrumentation Mechanics and Technicians				
1.8.1	This training module shall be developed for a multi-disciplinary team for overview of maintenance and breakdown of the supplied rig. The training shall focus on various systems and interlinkages, trouble shooting and remedies.				
1.8.2	The OIL personnel trained shall be capable to perform various schedule maintenance except the Major Overhauls at site without OEM support				
1.8.3	In case Rig Supplier doesn't have the training facilities for major bought-out equipment, the supplier shall arrange these training in consultation with / through the respective OEM				
1.9	Calibration Training Candidate: Instrumentation and Electrical Engineers				
1.9.1	This training module shall be for instrumentation and electrical engineers. Trained engineer shall be able to calibrate card, electrical system etc. on site without help of OEM support				
1.9.2	Any third-party software required for such calibration provided with the equipment shall be covered during the training course				
1.10	Onsite Training Candidate: Onsite Drilling crews				
1.10.1	Vendor shall educate the rig crew during the commissioning of the rig and equipment has and also provide on-site training for 5 days after commissioning of each rig package on the operational aspects, maintenance and care and advanced instrumentation.				
2	TABLE-TRAINING MODULES:				
	Training	Venue	No. of Days per batch	Persons / batch	No of batch
a)	Comprehensive training (including	OEM facility	15	13	3

	simulator training)				
b)	Rig operation and maintenance of equipment (Drilling, Rig building,& Mechanical)	SMP/ OEM training facility in India	05	6	2
c)	Breakdown, advanced maintenance and troubleshooting (Drilling, Rig building& Mechanical)		05	6	2
d)	Breakdown, advanced maintenance and trouble shooting (04 Elect /02Instt)		05	6	2
e)	Calibration Training (04 Elect /02 Instrumentation)		03	6	2
f)	On-site training after commissioni	Rig site	05	Rig crew	5

	ng of each rig package				
NOTE:	1) The bidder should quote <u>separately</u> for training at OEM facility in abroad, OEM training facility in India and on-site training after commissioning of each rig package. The training charges will be considered for evaluation of the offers. However, OIL may decrease or increase the number of persons to be trained at OEM facility in abroad or at OEM training facility in India and payment will be made on pro-rata basis. The bidder should also note that payment against training will be released only after successful completion of all the trainings. 2) On-site training charges after commissioning of each rig package, should include amongst others to and fro fares, boarding/lodging, local transport at Duliajan and other expenses of supplier's training personnel during their stay at Duliajan, Assam (India). 3) Travelling expenses of OIL's personnel (i.e., from Duliajan & back), boarding, lodging & food expenses during training at OEM facility in abroad or at OEM training facility in India will be on OIL's account.				

&&&

APPENDIX – AA-I

DRILLING CONTROL SYSTEM

The Drilling Control system will include following Items:

1. Drilling operator Station-Drillers Cabin (Drill Chair with Joystick and HMI)
2. Control System (software and corresponding hardware)

While considering the experience the Drilling Control system, the following supply will be considered:

1. System with minimum one drill chair and Joystick in the driller's cabin.
2. Control system with minimum operation control of following system:
 - a. Draw works.
 - b. Top drive.
 - c. Mud pump
 - d. VFD Motors
 - e. Power System.

APPENDIX – AA-II

LIST OF API CERTIFICATES TO BE ATTACHED WITH THE BID

Sl. No.	Equipment	Certification No	Remarks
1.	Rig Mast & Substructure	API 4F, PSL2	Bidder to submit, valid API certificates of the facility from which the equipment shall be provided.
2.	Crown Block Assembly	API 4F, PSL2	
3.	Draw works components	API 7K	
4.	Mud pump components		
5.	Rotary Table		
6.	Rotary power slip		
7.	Master bushing		
8.	Rotary & Vibratory Hoses	API 7K	
9.	Travelling Block	API 8C	
10.	Dead Line Anchor		
11.	Elevator Links		
12.	Casing / Drilling Line (Wire Rope)	API 9A	

APPENDIX – AA- III

THIRD PARTY INSPECTION

A. Bidder is to arrange for Third Party Inspection by any one of the following inspection agencies as per broad scope of work mentioned below. Bidder will confirm categorically their acceptance towards such TPI and confirm to extend all required facilities for TPI at respective plants during various steps of rig manufacturing. Bidder will quote the charges for such inspection separately and indicate in the priced bid which will be considered for bid evaluation.

1. ModuSpec Engineering Asia Pacific Pte Ltd, Singapore
2. Lloyds Register Drilling Integrity Services (LRDIS).
3. Aberdeen Drilling Consultant, UK.
4. Oil Field Audit & Service Inc., USA.

B. However, OIL reserves the right to arrange for inspection of the rigs through any of the third party inspection agencies including the above at its own cost. Bidder must extend the required facility for inspection by such agencies. Bidder is to confirm compliance of this requirement in the technical bid categorically.

Broad Scope of Third party Inspection

1	Definitions & abbreviations	
	1.1	For the purpose of this Procedure, the following Definitions shall apply:
	1.1.1	Third Party Inspection & Certifying Authority: TPICA
	1.1.2	Company: Oil India Limited
	1.1.3	Project Owner: Original Equipment Manufacturer / Rig Package Integrator
	1.2	Terms used in this Procedure referred to below are used for convenience of reference in this procedure only.
	1.2.1	Third Party Inspection & Certification Authority (TPICA): An Independent Inspection & certification Authority hired by the bidder (Rig package integrator), which will function to ensure that the requirements stipulated by OIL are compiled.
	1.2.2	Quality Manual: A document setting out the Manufacturer's Quality Policies, Systems, Procedures and Practices, including a listing of Procedures.
	1.2.3	Quality Assurance Plan (QAP) / Inspection & Test Plan (ITP): A document specific to each item, detailing for each production / manufacturing operation. This document shall specify the role of TPICA through the project as mentioned below:
	1.2.3.1	Witness Point (W): An activity designated by the Rig package integrator in consultation with OIL that requires the witness prior to acceptance of the Manufacturer's documentation.
	1.2.3.2	Hold Point (H): Where fabrication process cannot be continued by Rig package integrator / OEM until TPICA carries out witnessing and approve a certain activity done by the Rig package integrator / OEM during the process of manufacturer of rig components

		1.2.3.3	Information Point (I): Activity or documents or reports submitted by TPICA for information to OIL. Rig package integrator / OEM and OIL have the right to review and make comments.
		1.2.3.4	Review Point (R): An activity performed by TPICA through verification of record / documents submitted by the Rig Package Integrator or OEM.
		1.2.3.5	Random Inspection (RI): An inspection where TPICA plans to audit, monitor or witness the activity in process on a random or periodic basis.
		1.2.4	Test and Proof Test Report: Certification issued by TPICA stating that the material being supplied against the Project Requirements has undergone specific tests to demonstrate its acceptability.
		1.2.5	Waiver: Written confirmation of the Company / TPICA electing not to visit the manufacturer/ vendor to perform an inspection marked in the quality plan as a Hold point, or a Final Inspection. In the event of receipt of a waiver, the manufacturer / vendor shall submit one copy of all certification to the Company for review and endorsement, prior to continuing the next step of the fabrication activity.
		1.2.6	Non-conformance Report (NCR): A Company or Manufacturer document that highlights any non-conformance discovered during the execution of the work.
		1.2.7	Deviation Request (DR): A document that is issued by the Rig package integrator / OEM to request the Company's approval to deviate from PO requirements.
2	Responsibilities of TPICA		
	2.1	Responsibilities: It is the responsibility of the TPICA to	
		2.1.1	Ensure that activities / inspections are carried out in accordance with specifications, standards and quality assurance plans or inspection test plan of manufacturer duly approved by OIL.
		2.1.2	Ensure that the design of equipment (rig part) is not compromised and that any changes or deviations are documented and validated by relevant technical authorities / OIL so that the equipment meets the specified technical requirements.
		2.1.3	Certification of software capability in providing / calculating the reduced load / safe load capacity of the Rig mast and substructure and identification of critical members.
		2.1.4	Certification of Mast, Sub-structure for the rated capacity as per the API 4F-PSL 2 and confirm that overall rig mast and sub-structure is fit-for-intended use.
		2.1.5	TPICA shall be responsible for carrying out all necessary Visual, Dimensional, Functional checks, Function and pressure tests, chemical and physical checks for raw material as applicable.
		2.1.6	Witness the rig-up and rig-lowering operation and load test of the mast and substructure at rated hook load capacity at yard and certification.
3	Quality Assurance Plan (QAP) / Inspection & Test Plan (ITP):		
	3.1	OIL shall review the QAP/ITP submitted by the bidder to ensure adequacy of Inspection and testing activities to ensure compliance of the following:	
		3.1.1	The applicable Purchase Order document of OIL and reference document/ procedure numbers.

	3.1.2	Description of the item /activity to which the ITP / QAP applies.
	3.1.3	Reference to all applicable Standards, Codes, Specifications, identification of all activities necessary to verify conformance to PO requirements from commencement to shipment.
	3.1.4	Identification of all Hold (H), Review (R), Witness (W) and "I" points.
	3.1.5	Identification of applicable Inspection Standards and Acceptance Criteria for each inspection activity.
	3.1.6	Identification of Quality Control Forms and Records.
4	Quality control procedure	
	4.1	TPICA shall ensure compliance to the Quality Control Procedures being followed and adopted during the manufacturing process of rig mast, sub-structure and equipment. It will include but not limited to the following:
	4.1.1	Non-Destructive Examination Procedures (NDT)
	4.1.2	Testing Procedures
	4.1.3	Welding Procedure Specification (WPS)
	4.1.4	Product Quality Review (PQR) and Repair Procedures
	4.1.5	Post Weld Heat Treatment Procedures
	4.1.6	Manufacturing Procedures e.g. Forming and Heat Treatment
5	Scope of Work	
	5.1	General scope of work
	5.1.1	The Rig package integrator (bidder) shall hire Third party Inspection and Certification Authority for undertaking inspection of rigs as per ordered specification in the Purchase / Supply order.
	5.1.2	All equipment of rig shall be tested as per standard test procedure of Rig manufacturer and equipment manufacturers (QAP) and as per relevant API codes. Testing of mast and sub structure shall be carried out as per API 4F-PSL2.
	5.1.3	TPICA shall witness the rig-up, rig-lowering operation at rig package integrator yard.
	5.1.4	TPICA shall confirm that all items of the rig package have been inspected by them in accordance with the TPI Scope of work and conform to the technical requirements of OIL purchase order.
	5.1.5	The Third party inspectors after carrying out the inspection in accordance with the approved QAP shall provide a copy of their finding (i.e. inspection report) to the Rig Package Integrator and OIL. The consolidated TPI report for all the equipment provided to the Rig Package Integrator shall be included in the Rig data book.
	5.2	Detailed Scope of Work
	5.2.1	The inspection of Rig and equipment shall be conducted at the manufacturer's premises by the TPICA nominated by the Rig Package Integrator in accordance with approved Test & Inspection procedures and Quality Assurance Plan (QAP). OIL may also depute its own inspection team along with the TPI agency.
	5.2.2.1	Quality Manual: A document setting out the Manufacturer's Quality Policies, Systems, Procedures and practices, including a listing of procedures.
	5.2.2.2	Quality Control Plan / Inspection & Test Plan (ITP): A document specific to each item, detailing for each production / manufacturing operation.

		5.2.3	The details of tests to be conducted, test procedure to be followed and test certificate format with minimum and maximum limits of all parameters (as applicable) to be recorded during testing along with Inspection schedule of tests and duration shall be provided by manufacturer.
		5.2.4	The Rig Package Integrator / Bidder shall co-ordinate with the equipment manufacturers and shall notify the readiness of equipment for testing & inspection at least one month in advance to OIL.
		5.2.5	The manufacturer shall facilitate the TPICA agency in carrying out the inspection and testing in accordance with the QAP by providing all the necessary facilities for testing and inspections of equipment at their premises.
		5.2.6	The Rig Package Integrator / Bidder shall offer the Rig at rig-up yard for "System Integration Tests (SIT)" after erection of rig mast and integration of rig equipment
		5.2.7	List of equipment for carrying out Third Party inspection (TPI) is provided in <u>Table-1</u> .
		5.2.8	The QAP submitted by the bidder shall be reviewed by OIL and the final scope for inspection by TPICA for various items shall be firmed up and communicated to the successful bidder.
		5.2.9	The bidder shall submit the Rig data book which shall include the TPI report of all the equipment provided to them by the Third party inspectors.
		5.2.10	System Integration Tests (SIT): The System Integration Tests (SIT) shall be carried out at the rig-up yard of the rig package integrator to check and confirm the following:
		5.2.10.1	To demonstrate that the drilling systems will integrate correctly with each other and perform as per design.
		5.2.10.2	It will verify all zone management systems.
		5.2.10.3	Verify that there are no mechanical interferences while performing drilling or pipe handling operations.
		5.2.10.4	Identify any safety issues with equipment or procedures.
		5.2.10.5	Identify system problems with vibration / noise / EMI / human interface / pollution.
		5.2.11	Pipe Handling SIT
		5.2.11.1	The purpose of the test is to check and confirm that all installed pipe handling and related equipment have been properly integrated and meeting the intended purpose as per the tender specification and requirement.
		5.2.11.2	Part of this test shall include, picking up drill pipe and drill collars and making up and laying down of the same. It shall all include building of stands, pipe racking/storing and taking from setback, running and tripping out.
		5.2.11.3	Auto tripping function shall be witnessed and any technical glitch shall be noted and rectified.
		5.2.11.4	Bidder shall arrange elevators of required sizes, drill pipes (5") and drill collars (9" or 8") for the test.

			5.2.11.5 Typical equipment that will be involved in the Pipe handling SIT are as follows: • Driller's Chairs / Driller Cabin • Drawworks • Top Drive • Iron Roughneck • Hydraulic Cat Walk • Hydraulic Power Slip • Finger Board • CCTV
		5.2.12	Power & Endurance SIT
		5.2.12.1	The power and endurance test will be carried out to test the endurance of the individual equipment and to test capability of the power generation and electrical / hydraulic power systems.
		5.2.12.2	The test is to verify that power system functions as designed and will prevent overload of the power generation system during normal operations and in the event of critical power system failures. Failure of the system will be introduced by deliberately opening generator circuit breakers, forcing generator stops and preventing SAS-controlled starts.
		5.2.12.3	It will also determine the systems capability of running the Mud pumps at high load for an extended period.
		5.2.12.4	The running temperatures of all equipment involved in the testing should be monitored closely to determine when the temperature stabilize, if the temperature keeps on raising then the test will be extended until stabilization occurs. The test will typically be completed within 12 – 24 hours
		5.2.12.5	If there is a breakdown of any major equipment for more than 15 minutes during the endurance test, the entire test will have to be retaken from the start.
		5.2.13	Review and recommend ITP/QAP document submitted by the Rig Package Integrator / Bidder for approval of OIL.
		5.2.13.1	ITP / QAP of the original equipment manufacturer submitted by the bidder along with bid shall be reviewed by OIL.
		5.2.13.2	Any deletion or addition of R/W/H/I points recommended by OIL shall be incorporated in the QAP and intimated to the original equipment manufacturer by bidder to avoid non-compliance during inspection stage.
		5.2.14	Implementation of ITP / QAP and flagging of issues by TPICA.
		5.2.14.1	Inspection of rig (s) and equipment shall be carried out as per standard test procedures of rig / equipment manufacturing and as per requirements of applicable API
		5.2.14.2	TPICA shall be responsible to be physically present at the original equipment manufacturer location in order to fully implement the ITP/QAP requirements.
		5.2.14.3	TPICA shall be responsible to flag issues and deviations if any and immediately inform to OIL.

5.2.14.4	TPICA shall be responsible to verify the welding procedures and welders qualification, for the specific OIL PO requirement; to comply with the API 4F- PSL2 requirement of mast and substructure.
5.2.14.5	The functional tests of rig equipment's shall be performed, to be witnessed by TPICA in accordance with the QAP.
5.2.14.6	TPICA shall be responsible to communicate directly with OIL regarding the progress of the project.
5.2.15	TPICA scope of work on the project is to provide an independent third party inspection services covering the following aspects:
5.2.15.1	Material Inspection and traceability.
5.2.15.2	Mechanical testing and hardness testing witness.
5.2.15.3	Chemical analysis review.
5.2.15.4	Heat treatment: Quenching and tempering witness/ review.
5.2.15.5	Ultrasonic thickness gauging.
5.2.15.6	Welding and NDT inspection.
5.2.15.7	Visual inspection.
5.2.15.8	Final product: Dimensional inspection check.
5.2.15.9	Functional testing as applicable.
5.2.15.10	Pressure test as applicable.
5.2.15.11	Leak test as applicable.
5.2.15.12	Blasting and Painting inspection.
5.2.15.13	Manufacturer quality dossier review.
5.2.15.14	Pre-shipment inspection.
5.2.16	Witness load test and certification
5.2.16.1	TPICA shall witness the rig-up and rig-lowering operation of each rig at Rig Package Integrator / bidder facility. The glitches during the operation and corrective measures taken to mitigate them shall be recorded and appraised to OIL.
5.2.16.2	The rig shall be assembled at designated rig-up yard to facilitate load testing. TPICA shall witness and certify 100% load test of mast to rated hook load capacity for each rig. The Load test certificate shall be endorsed by TPICA and submitted for each rig and shall be included in the inspection report and Rig data book.
5.2.17	Pre-dispatch inspection and submission of report
5.2.17.1	TPICA shall ensure that all items supplied have a name plate at suitable location with Make, Model, Sr. no., Year of Manufacturer, Rating / capacity and any other relevant data of equipment, etc.

			5.2.17.2	TPICA shall ensure that accepted items are easily identified with seal, wherever applicable and reference of seal and its location will be given in the Inspection report.
			5.2.17.3	The TPICA during the process of inspection of Rig mast and substructure shall also visually inspect and review the painting procedure in accordance with the QAP and the packaging prior to shipment. All relevant documentation shall be provided by the manufacturer to TPICA for review including but not limited to equipment certifications, manuals, QC documentations etc.
			5.2.17.4	TPICA to ensure that all drawings, manuals are in English language.
			5.2.17.5	The inspection by TPICA shall be carried out in stages during the process of rig manufacturing. The inspection reports with findings shall be submitted to OIL for appraisal and acceptance after carrying out the stage inspection.
			5.2.17.6	TPICA shall submit the final inspection report after successful inspection of all stage inspections. The report submitted shall be in English language, clearly confirming the conformance of the rig and equipment to the tender specification and QAP and its acceptability. Deviations taken if any and or modification/ rectification done and the subsequent acceptability should be clearly brought out in the report.
			5.2.17.7	TPICA shall be responsible to issue the "release note" to OIL certifying that rig is meeting all requirements of OIL PO specification.

Table 1	
List of Items covered under TPI	
Sl. No.	Item Description
1	Rig mast and sub-structure
2	Mud Tanks including Trip tank
3	Air Tanks
4	Fuel tanks
5	Water tanks
6	VFD House
7	AC PCR
8	Drillers Cabin
9	Hydraulic cylinders for Mast & sub-structure raising
10	'H' Manifold & High Pressure Mud Lines
11	Stand Pipe
12	Vibratory Hose
13	Rotary Hose
14	Top Drive
15	Draw-works
16	Iron Rough Neck
17	Hydraulic Catwalk
18	Mud Pump & Pulsation Damper
19	Jet Shearing Device
20	Shale shaker
21	LMMC and Desander
22	Degasser
23	Power Pack (Engines + Alternator)
24	Air compressor
25	Pneumatic Winches
26	Hydraulic Power Unit
27	BOP Cart
28	Motors 100HP & higher
29	Electrical Power Cables
30	Mud Gas Separator
31	Crown block & Sheaves
32	Dead line Anchor
33	Casing/Drilling line
34	Casing Line Spooler
35	Elevator links
36	Travelling block & Sheaves
37	Hydraulic Slips
38	Mud Agitators
39	Centrifuge
40	Cellar pit Pump
41	High Pressure Rig wash Unit
42	Rig Instrumentation
43	Intercom/Paging/PA system
44	CCTV System
45	Centrifugal pumps

APPENDIX – AA- IV

THE SCOPE OF WORK FOR INSTALLATION & COMMISSIONING

The Scope of work for Installation & Commissioning of Rig in broad sense shall be as under but not limited to:

Sl. No.	Scope of work
1	Bidders shall confirm categorically that Installation & Commissioning of the Rig Package with all accessories would be carried out by their competent personnel at OIL's designated drill site, in Duliajan, ASSAM, INDIA.
2	The scope of Installation and commissioning shall include the complete Rig and equipment supplied with the Rig package. Bidders should specifically note that commissioning for rig electricals will be in two stages.
3	The logistics/transportation of complete Rig and equipment from OEM facility to Port of Dispatch (FOB) and its safe custody (security) till dispatch to India shall be on bidders account.
4	The commissioning of rig shall include complete Rig up (with all equipment alongwith supply of commissioning spares) at identified OIL site as well as supervision of rig and its equipment for its smooth operation for a period of 30 rig operating days after spudding of 1 st well. The contractor shall be responsible for replacement of any failed components of rig and its equipment during this period at their cost.
5	The contractor shall also supervise the lowering of mast, dismantling of rig at 1st location and assembly of rig and rig up at 2nd location.
6	The contractor should deploy the required number of person(s), well conversant with installation, commissioning and rig operations. The contractor personnel should be able to communicate in English language. The contractor shall make the necessary arrangement for boarding, lodging and transportation of its personnel at their own cost.
7	The basic facilities required for installation & commissioning such as Crane service, electric power, water supply, pressurized air and welding & cutting set shall be provided by OIL. Rig-up at designated site will be the responsibility of OIL but, supplier should provide the supervisory assistance by deputing their competent personnel including API certified welder (if required).

APPENDIX - AA-V

HEALTH, SAFETY & ENVIRONMENT (HSE) POINTS

A.0	HEALTH, SAFETY & ENVIRONMENT (HSE) POINTS: The OEM shall be solely responsible to comply all the statutory norms as applicable while executing the job. It will be solely the OEM's responsibility to fulfil all the legal formalities with respect to the Health, Safety and Environmental aspects of the entire job (namely: the person employed by him, the equipment, the environment, etc.) under the jurisdiction of the district of that state where it is operating. It will be the responsibility of the OEM/his Supervisor/representative to ensure strict adherence to all HSE measures and statutory Rules during operation in OIL's installations and safety of the personnel engaged by him. The OEM crew members will not refuse to follow any instruction given by representative of OIL. The OEM shall adhere to following HSE points while performing the works under this supply order during the Installation & Commissioning period, Warranty period and during subsequent AMC period for any trouble shooting and maintenance activities at well sites:
1	The OEM shall ensure complete safety of the personnel engaged by him, and of all the equipment, they will handle and must take full responsibility for their safety.
2	OEM's arrangements for health and safety management shall be consistent with those for the company (OIL).
3	An OEM employee must, while at work, take reasonable care for the health and safety of people who are at the employee's place of work and who may be affected by the employee's Act or omissions at work.
4	Statutory forms to be maintained in respect to Mines Act, 1952, Mines Rules 1955, Oil Mines Regulations 2017, the Environment (Protection) Act-1986 and other applicable laws.
5	The OEM, wherever applicable, shall obtain necessary hazardous waste authorization from the State Pollution Control Board for storage, handling and disposal of hazardous waste.
6	The OEM has to keep a register of the persons employed by him/her. The OEM's supervisor shall take and maintain attendance of his men every day for the work, punctually.
7	Every person deployed by the OEM must use appropriate PPEs (Personal Protective Equipment) to be provided by the OEM. The OEM shall provide Personnel Protective Equipment as per the hazard identified and risk assessed for the job and conforming to statutory requirement and company's PPE schedule. Safety appliances like protective footwear, Safety Helmet and Full Body harness, Fall Prevention Devices (FPD) shall conform to relevant IS codes. Necessary supportive document shall have to be available at site as proof. If the OEM fails to provide the safety items as mentioned above to the working personnel, the OEM may request to the Company (OIL) for providing the same. In case of exigency OIL will provide the safety items if available. However, in turn, OIL will recover the actual cost of the items by deducting from OEM's Bill. However, it will be the OEM's sole responsibility to ensure that the persons engaged by him in the mines use the proper PPE while at work. OEM employees should be trained in the proper use and maintenance of PPE. In absence of appropriate PPEs, the representative of OIL has the right to stop the work which will be binding for the OEM. Moreover, the accountability towards any delay in work/ penalty due non-adherence to PPE shall be binding to the OEM.

8	Soft copy of the Standard Operating Procedures (SOPs) related to scope of work shall be handed over to the representative of OIL by OEM including an assessment of risk, wherever possible and safe methods to deal with it/them. Printout of copy (spiral binding) of the SOP mentioned above is to be kept with all working teams at all times. The SOP clearly stating the risk arising to men, machineries & material from the mining operation / other operations to be done by the OEM and how it is to be managed. However, in case of any doubts, the OEM shall reconfirm the same from the Engineer In Charge (OIL).
9	OEM has to ensure that all work is carried out in accordance with the Statute and the SOP and for the purpose he may deploy adequate qualified and competent personnel for the purpose of carrying out the job in a safe manner. For the work, which is not covered under SOP, the OEM shall develop it and submit to the representatives of OIL.
10	In case of deviation of SOP or non-availability of SOP, Job Safety Analysis (JSA) shall be carried out before commencement of the work.
11	Necessary cold and hot work permits including excavation clearance and permission for working at height, Confined Space Entry as applicable are to be obtained by the competent person of the OEM from the site representative of OIL before start of the job(s). Work Permit System should be inline as per guidelines issued by HSE Department.
12	The OEM's personnel should be aware about the existing as well as probable hazards and ensured their training to tackle such untoward events by the OEM. If the Company (OIL) arranges any safety awareness program / training for the working personnel at site (company employee, OEM worker, etc.) the OEM will not have any objection to any such training.
13	The Contactor personnel shall arrange daily meeting and monthly pit level meeting headed by the OIL Engineer and maintain records accordingly. Safety Briefing, Evacuation plan in case of emergency and how to inform (in case of emergency) to be discussed during the Toolbox meeting.
14	After receipt of the work order the OEM shall have to submit authorized list of Contract Personnel, who will be engaged for the jobs including name of the OEM's competent persons and every contact details. No person shall be engaged in any job in a mine unless his competency has been assessed and approved by the OIL Engineer In-Charge.
15	The OEM shall not engage minor labourer below eighteen (18) years of age under any circumstances.
16	OIL will communicate all information to the OEM or his authorized representative only.
17	The OEM shall have to report all incidents including near miss to the representative of OIL who shall be supervising the OEM's work.
18	Any compensation arising out of the job carried out by the Contractor whether related to pollution (Attributable to the OEM), Safety or Health will be paid by the Contractor only.
19	Any compensation arising due to accident of the OEM's personnel while carrying out the job, will be payable by the OEM and their medical treatment/ facilities in case of accidents should be provided by the same OEM. The OEM's personnel should be aware about the existing as well as probable hazards and ensured their training to tackle such untoward events by the OEM.
20	OEM shall keep a reasonable degree of order by disposing of accumulated rubbish and excess material. Disposal of solid wastes generated by the OEM shall be in accordance with

	the company's Procedure for Solid Waste Management. The OEM Personnel have to take every possible care to keep the environment clean and free from pollution.
21	The OEM have to ensure the quality and reliability of all the tools, equipment and instruments they use. The supporting documents relevant to prove the above should be submitted. Defective tools shall be immediately removed.
22	OEM's Supervisor/ OEM's personnel needs to be aware about the site specific emergency response plan (which includes display of emergency contact nos., establish telephone communication, layout of working area, use of fire extinguisher, emergency exit, assembly point).
23	Barricading of area to be done with reflecting tapes as applicable during work.
24	Smoking is prohibited in all Company restricted areas except in authorized smoking areas/ shelters. Carrying of matches and lighters into the Hazardous Area is prohibited. Cellular phones shall not be used in operating areas / hazardous areas unless they have been classified as 'intrinsically safe' for use in that atmosphere. Consumption of alcohol and possession of non- prescribed drug in Company work site is strictly prohibited.
25	When there is a significant risk to health, environment or safety of a person or place arising because of a non-compliance of HSE Measures Company will have the right to direct the OEM to cease work until the non-compliance is corrected.
26	The OEM personnel should understand the implication of the known hazards related to the work undertaken by them and the necessity of having an emergency plan approved by OIL to counter them, if anything goes wrong.
27	In case OEM is found non-compliant of HSE laws as required and all the above mentioned general HSE points, company will have the right for directing the OEM to take action to comply with the requirements, and for further non- compliance, the OEM will be penalized as per the terms of the Contract/PO.
28	Considering the ongoing Covid-19 pandemic, those who are engaged in the above operations should be followed the Covid-19 Protocol as per the prevailing Government Guidelines. Any requirement arise by the Statutory Authorities during the period of contract shall be applicable and binding for the OEM.
29	All persons deployed by the OEM shall be medically fit and have job specific training to perform the activities intended for the installation and commissioning at site under this contract/PO.
30	The first-Aid box should be provided by the OEM and the same must be kept ready to use at site throughout the working hours for use by their personnel.
31	The OEM should frame a mutually agreed bridging document between OIL & the OEM for all issues not envisaged under the terms and conditions of the contract/PO with the roles and responsibilities clearly defined

APPENDIX – AA -VI

MANDATORY SPARES – RIG WISE & COMMON

Bidder(s) must quote for all the mandatory spares (rig wise & common) listed hereunder and the same will be considered for evaluation. It will be obligatory on the part of the successful bidder to supply all the mandatory spares (rig wise & common) as per the quantity mentioned in this Appendix.

Mandatory spares (rig wise & common) listed hereunder are minimum requirement of OIL. However, bidder(s) on their own should also quote for additional mandatory spares (rig wise & common), if such spares are required as per their offered product/equipment. Such mandatory spares quoted additionally by the bidder shall also be considered for evaluation in addition to the mandatory spares (rig wise & common) listed hereunder. The successful bidder will have to supply all such additional mandatory spares along with Rigs.

PART – I :: MANDATORY SPARES TO BE SUPPLIED PER RIG

SL. NO.	CORRESPONDING TENDER SECTION / CLAUSE	DESCRIPTION OF MANDATORY SPARE	PART NO, IF ANY	QUANTITY REQUIRED PER RIG	UOM
1.	2.1.11.1	Wash pipe assembly with Five (5) sets of packing (01 set per TDS)		02	Set
2.		TDS saver sub (NC50)		01	No.
3.		Hydraulic oil filter		02	No.
4.		Gear oil filter		02	No.
5.		Upper & Lower IBOP with repair kit		02	each
6.	2.3	Lube oil filter		02	Set
7.		Gear Oil Filter		02	Set
8.		Kick back roller,		02	Set
9.		Casing line spooler		02	Set
10.	2.5.6	Drive chain for IRD		02	No.
11.	3.1	IRON ROUGHNECK:			
12.	3.1.11	Dies		02	Set
13.		Special Grease/lubricant		05	Kg
14.		Rollers		02	Set
15.	3.4.7	Spring assembly as spare per cathead.		02	Set
16.	4.15.6.1	API 20 / 25		40	Set
17.	4.15.6.2	API 35 / 40		40	Set
18.	4.15.6.3	API 50		30	Set
19.	4.15.6.4	API 60/70		40	Set
20.	4.15.6.5	API 80		40	Set
21.	4.15.6.6	API 100		40	Set
22.	4.15.6.7	API 120		40	Set
23.	4.15.6.8	Crown Rubber/Rubber Beddings		06	Set
24.	Note:	1 Set= No. Of screen required in one LMSS			
25.	4.15.6.9	Vibrator motor		2	No.

26.	4.15.6.10	Vibrator motor bolt		3	Set
27.	4.15.6.11	Deck Spring per rig		3	No.
28.	4.16.4.1	API 170		30	Set
29.	4.16.4.2	API 200/API 230		40	Set
30.	4.16.4.3	API 270		40	Set
31.	4.16.4.4	API 325		10	Set
32.	4.16.4.5	Crown Rubber/ Rubber Bedding		6	Set
33.	4.16.4.6	Desander Cones		4	No.
34.	4.16.4.6.a	Desander Cones bend		4	No.
35.	4.16.4.7	Desilter Cones		8	No.
36.	4.16.4.7.a	Desilter Cones bend		8	No.
37.	4.16.4.8	Vibrator motor		2	No.
38.	4.16.4.9	Vibrator motor bolt		3	Set
39.	4.16.4.10	Deck spring		3	No.
40.	Note	1 Set= No. Of screen required in one LMMC			
41.	6.12	AIR WINCH FOR RACKING BOARD:			
42.	6.12.12	Filter		2	No
43.		Lubricator		2	No
44.		Strainer		2	No
45.		Regulator		2	No
46.		Airline and fittings		2	Set
47.	6.13.11	Filter		2	No
48.		Lubricator		2	No
49.		Strainer		2	No
50.		Regulator		2	No
51.		Airline and fittings		2	Set
52.	6.14	AIR WINCH (DRILLING USE):			
53.	6.14.9	Filter		2	No
54.		Lubricator		2	No
55.		Strainer		2	No
56.		Regulator		2	No
57.		Airline and fittings		2	Set
58.	6.15	HYDRAULIC POWER UNIT (Electric Driven):			
59.	6.15.7	Hydraulic Filter		2	No
60.		Air Filter		2	No
61.		Hand Pump for hydraulic top up		1	No
62.	1.11	Dual Standpipe Manifold - "H" Style, 7500 psi			
63.		4" flanged gate valve, Max WP 7500 Psi		3	NO
64.		Repairing kit ,4" flanged gate valve,7500PSI MWP		15	SET
65.		2" screwed end gate valve, Max WP 7500 Psi	-	4	NO
66.		Repairing Kit, 2" screwed end gate valve, Max WP 7500 Psi		9	SET
67.		0-10000 PSI gauge, type D, 2" Female	-	2	NO
68.		3.1/2" ID x 5 Ft, vibratory hose Grade E, 7500 PSI WP	-	4	NO

69.	SECTION – 4:	4.5 SPARE FOR MUD PUMP			
70.	4.5.1	Liner (any one size) with liner gasket 7" /7¼" /7½"	-	84	NO
71.	4.5.2	Liner (any one size) with liner gasket 6" /6 ¼" /6½"	-	48	NO
72.	4.5.3	Piston Assembly (any one size) 7" /7¼" /7½"	-	54	NO
73.	4.5.4	Piston Assembly (any one size) 6"/6 ¼ " /6½"	-	36	NO
74.	4.5.5	Piston Rod complete with Clamp	-	6	NO
75.	4.5.8	Valve Seat	-	70	NO
76.	4.5.9	Valve assembly with polyurethane insert	-	100	NO
77.	4.5.10	Valve insert (polyurethane)	-	200	NO
78.	4.5.11	Valve spring	-	80	NO
79.	4.5.12	Valve cover gasket	-	200	NO
80.	4.5.13	Liner gasket, (any one size) 7"/7¼" /7½ "	-	90	NO
81.	4.5.14	Liner gasket, (any one size) 6"/ 6 ¼ " / 6½"	-	90	NO
82.	4.5.15	Wear plate gasket	-	24	NO
83.	4.5.16	Wear plate	-	18	NO
84.	4.5.18	Banded power belt ,left and right	-	4	SET
85.	4.5.19	Pulsation Damper repair Kit with Pressure Gauge (0-7500 psi)	-	3	NO
86.	4.5.20	Valve seat puller with Pump set	-	1	NO
87.	4.5.21	Lube Oil Pump Assembly with Love joy Coupling, if applicable	-	2	NO
88.	4.5.22	Flushing Pump Assembly with Love joy Coupling	-	1	NO
89.	4.5.23	Lube oil Filters	-	3	NO
90.	4.5.24	Ring Gasket for Suction, Discharge Manifold and Pulsation Dampener etc.	-	12	SET
91.	4.5.25	Stroke counter meter (To be confirmed by Cementing)	-	2	NO
92.	4.5.26	Belt tension meter (analogue)	-	2	NO
93.	4.5.27	3" RRV ,(1500 psi – 7500 psi), Manual reset	-	1	NO
94.	4.5.28	Special Tools for fluid end & pulsation dampener maintenance	-	1	SET
95.	4.5.30	Pulsation Dampener Complete (rating 7500 psi) of Make- Mattco or equivalent , (same make & model as per offer).	-	3	NO
96.	4.5.31	Strainer Cross Piece (7500 psi rating)	-	1	NO
97.	4.5.32	Infrared thermometer	-	1	NO
98.	4.5.33	Piston Rubber (any one size) 7" /7¼" /7½"	-	108	NO
99.	4.5.34	Piston Rubber (any one size) 6"/6 ¼ " /6½"	-	108	NO
100.	4.5.35	Liner Bushing Puller and Wear Plate Puller (if applicable)	-	1	NO

101.	4.5.36	Charging Hose assembly (with fittings) for Nitrogen pre-charging in Pulsation dampener		1	NO
102.	4.5.37	Valve Cover	-	6	NO
103.	4.5.38	0-10000 PSI Pr. gauge, type D, 2" Female	-	3	NO
104.	4.5.39	3" gate valve, Max WP 7500 Psi,		3	NO
105.	4.5.40	Repairing Kit, 3 gate valve, Max WP 7500 Psi		9	SET
106.	4.5.41	10",8"& 6"etc Butterfly valve		9	NO
107.	4.5.42	Vibrator hose, API Grade-E, 3.1/2 inch ID		9	NO
108.	Notes:	Sizes of Liner(s) shall be same as the offered Pistons, wherever applicable			
109.	SECTION – 4.7	GROUND MANIFOLD SYSTEM FOR THREE PUMPS (Refer Fig– A, Section-4.7 of Technical Specifications)			
110.		4" flanged gate valve, Max WP 7500 Psi	-	3	NO
111.		Repairing kit ,4" flanged gate valve,7500PSI MWP		15	SET
112.		2" screwed end gate valve, Max WP 7500 Psi	-	4	NO
113.		Repairing Kit, 2" screwed end gate valve, Max WP 7500 Psi		9	SET
114.		0-10000 PSI gauge, type D, 2" Female	-	2	NO
115.		3.1/2" ID x 3 m, vibratory hose Grade E, 7500 PSI WP	-	4	NO
116.	SECTION – 4.8	MUD SUPERCHARGING PUMP			
117.		Frame, Pedestal	-	6	NO
118.		Casing	-	9	NO
119.		Gasket kit	-	24	SET
120.		Impeller (size as per offer)	-	9	NO
121.		Impeller seal	-	30	NO
122.		Cover stuffing box	-	9	NO
123.		Gland set (unit set)	-	30	NO
124.		Mechanical Seal	-	40	SET
125.		Ring lantern half	-	24	SET
126.		Gland bolt assembly (unit set)	-	40	SET
127.		Shaft	-	12	NO
128.		Sleeve shaft	-	24	NO
129.		Seal shaft sleeve	-	24	NO
130.		Deflector	-	24	NO
131.		Deflector seal	-	24	NO
132.		Cover inboard bearing	-	8	NO
133.		Gasket inboard bearing cover	-	20	NO
134.		Seal inboard bearing cover	-	24	NO
135.		Exclusion Seal inboard bearing	-	24	NO
136.		Bearing inboard	-	24	NO
137.		Seal bearing housing	-	24	NO
138.		Outboard bearing housing bolt	-	40	NO

139.		Cover outboard bearing	-	9	NO
140.		Seal out board Bearing	-	24	NO
141.		Oil Seal out board bearing cover	-	24	NO
142.		Bearing outboard	-	24	NO
143.		Kit locknut (unit set)	-	24	NO
144.		Housing, bearing out-board	-	9	NO
145.		Rubber flex coupling (Tyre complete Hub)	-	3	NO
146.		Rubber flex coupling (Tyre complete Hub): If the coupling of Supercharger/ Mud Mixer/ Desander/ Desilter/ Degasser are of same size & type	-	5	NO
147.	4.9	MUD MIXER PUMP			
148.		Frame, Padestal	-	3	NO
149.		Casing	-	4	NO
150.		Gasket kit	-	24	SET
151.		Impeller (size as per offer)	-	9	NO
152.		Impeller seal	-	30	NO
153.		Cover stuffing box	-	5	NO
154.		Gland set (unit set)	-	30	NO
155.		Mechanical Seal	-	40	SET
156.		Ring lantern half	-	14	SET
157.		Gland bolt assembly (unit set)	-	20	SET
158.		Shaft	-	6	NO
159.		Sleeve shaft	-	14	NO
160.		Seal shaft sleeve	-	14	NO
161.		Deflector	-	14	NO
162.		Deflector seal	-	14	NO
163.		Cover inboard bearing	-	6	NO
164.		Gasket inboard bearing cover	-	12	NO
165.		Seal inboard bearing cover	-	24	NO
166.		Exclusion Seal inboard bearing	-	24	NO
167.		Bearing inboard	-	24	NO
168.		Seal bearing housing	-	24	NO
169.		Outboard bearing housing bolt	-	30	NO
170.		Cover outboard bearing	-	9	NO
171.		Seal out board Bearing	-	24	NO
172.		Oil Seal out board bearing cover	-	24	NO
173.		Bearing outboard	-	24	NO
174.		Kit locknut (unit set)	-	24	NO
175.		Housing, bearing out-board	-	9	NO
176.		Rubber flex coupling (Tyre)	-	2	NO
177.	4.10	CENTRIFUGAL PUMPS FOR SOLID CONTROL (DESANDER/DESILTER/DEGASSER PUMP):			
178.		Frame, Padestal	-	6	NO
179.		Casing	-	9	NO
180.		Gasket kit	-	24	SET
181.		Impeller (size as per offer)	-	9	NO
182.		Impeller seal	-	30	NO
183.		Cover stuffing box	-	9	NO

184.		Gland set (unit set)	-	30	NO
185.		Mechanical Seal	-	40	SET
186.		Ring lantern half	-	24	SET
187.		Gland bolt assembly (unit set)	-	40	SET
188.		Shaft	-	12	NO
189.		Sleeve shaft	-	24	NO
190.		Seal shaft sleeve	-	24	NO
191.		Deflector	-	24	NO
192.		Deflector seal	-	24	NO
193.		Cover inboard bearing	-	8	NO
194.		Gasket inboard bearing cover	-	20	NO
195.		Seal inboard bearing cover	-	24	NO
196.		Exclusion Seal inboard bearing	-	24	NO
197.		Bearing inboard	-	24	NO
198.		Seal bearing housing	-	24	NO
199.		Outboard bearing housing bolt	-	40	NO
200.		Cover outboard bearing	-	9	NO
201.		Seal out board Bearing	-	24	NO
202.		Oil Seal out board bearing cover	-	24	NO
203.		Bearing outboard	-	24	NO
204.		Kit locknut (unit set)	-	24	NO
205.		Housing, bearing out-board	-	9	NO
206.		Rubber flex coupling (Tyre)	-	3	NO
207.	4.11	MULTISTAGE CENTRIFUGAL PUMPS			
208.		Impeller Set		1	SET
209.		Repairing kit (inclusive bearings)		2	SET
210.	4.12	MUD AGITATORS			
211.		Gear Box Complete (type-1) ,as applicable	-	3	NO
212.		Gear Box Complete (type-2) ,as applicable	-	5	NO
213.		Gear Box Repair Kit (type-1)) ,as applicable	-	8	SET
214.		Gear Box Repair Kit (type-2) ,as applicable	-	12	SET
215.		Flexible Coupling, Motor with Gear Box	-	13	NO
216.		Coupling, Gear Box with Impeller Shaft	-	13	NO
217.		Output shaft of Gear Box	-	6	EACH
218.		Impeller Shaft	-	3	NO
219.		Impeller Blade	-	3	NO
220.		Mud Gun Complete	-	1	NO
221.	4.13	MUD TANKAGE SYSTEM	-		
222.		Complete Couplings (dresser) -all sizes	-	20	NO EACH
223.		Rubber of Couplings (dresser) -all sizes	-	30	NO EACH
224.		Vertical Dump Valve, Complete	-	2	NO
225.		Repairing Kit, Vertical Dump Valve	-	13	NO
226.		O -ring/Gasket for Vertical Dump Valve, wherever applicable	-	50	NO

227.		Vertical Valve End Cover, if available (not preferred design)	-	13	NO
228.		10/12" Drain/Cleaning Valve		10	NO
229.		Butterfly valve-all sizes		6	NO each
230.	4.13.5	PUMP FOR TRIP TANK:			
231.		Centrifugal Pump Complete, 3"x2"		2	NO
232.		Repairing Kit		4	NO
233.		Pedestal/Frame		1	NO
234.		Casing		2	NO
235.		Shaft		2	NO
236.		2" & 3" Butterfly valve & Fittings		6	No each
237.		2" , 100R1 Hose with Nipple ,NPT threaded both end/ FIG 102, 12 meters min length each		4	NO
238.	4.17	VACUUM TYPE DEGASSER			
239.		Vacuum Pump, Complete		1	NO
240.		Repair Kit		3	NO
241.		Vacuum Compressor, Complete, if applicable		1	NO
242.		Repair Kit of Vacuum compressor.		3	NO
243.		Belt ,If applicable		4	SET
244.	5.1	POWER SYSTEM: RIG ENGINE(POWERPACKS)			
245.		Lube oil filter		48	NO
246.		Fuel Filter		60	NO
247.		Air Filter(s)		24	SET
248.		Sensors/Switch (complete set)		2	SET
249.	5.2.1.11	250 KVA AUXILLARY GENSET			
250.		Lube oil filter(s)		30	NO / EACH
251.		Fuel Filter(s)		36	NO / EACH
252.		Air Filter(s)		16	SET
253.		Fuel Pre-filters		8	NO / EACH
254.		Water oil separator, if applicable		4	SET
255.		Charging Alternator		1	NO
256.		Sensors/Switch (complete set)		2	SET
257.		Fuel Injector		1	SET
258.		Fuel Injection Pump ,if applicable		1	NO
259.		Self/ Air-Starter		1	NO
260.		Repair Kit-Self/ Air-Starter		4	SET
261.		Belt ,if applicable		2	SET
262.		Padestal Bearing with Fan Shaft ,IF applicable		1	SET
263.		Fan for Heat Exchanger		1	NO
264.		Industrial Type Battery Charger (12 v/24v DC)		1	NO
265.		Battery 12 Volt DC, 180 AH (if applicable)		2	NO
266.		Turbocharger		2	NO
267.		Exhaust Bellow		3	NO
268.		Radiator		1	NO
269.	6.1	SCREW AIR COMPRESSOR (ELECTRICALLY DRIVEN)			
270.		Sensors/Switch (complete set)		2	SET

271.		Oil strainer /Separator		2	NO
272.		Oil filter(s)		16	NO
273.		Lubricant /Coolant		60	Liters
274.		Air filter(s)		16	NO
275.		Thermostat Valve, if appl.		2	NO
276.		Banded Belt		6	SET
277.		Control Panel		1	NO
278.	6.1.18 & 6.2	PRIME MOVER OF COLD START AIR COMP:			
279.		Lube oil filter(s)		30	NO /EACH
280.		Fuel Filter(s)		36	NO /EACH
281.		Air Filter(s)		16	SET
282.		Fuel Pre-filters		8	NO /EACH
283.		Charging Alternator		1	NO
284.		Sensors/Switch (complete set), IF APPL		2	SET
285.		Fuel Injector		6	NO
286.		Fuel Injection Pump ,if applicable		1	NO
287.		Self-Starter		1	NO
288.		Repair Kit-Self		2	SET
289.		Belt ,if applicable		6	SET
290.		Top overhauling Repair Kit of Engine		1	NO
291.		Battery 12 Volt DC, 150 AH		2	NO
292.		Control panel		1	NO
293.		All gauges		1	SET
294.		6.2 COLD START AIR COMPRESSOR			
295.		Air filter(s)		16	NO
296.		Banded Belt		6	SET
297.		Repairing Kit		6	SET
298.	6.3	AIR DRYER UNIT			
299.		Sensors/Switch (complete set)		2	SET
300.		Repairing Kit		6	SET
301.	6.6	CELLAR PIT PUMP			
302.		Repairing Kit (including bearing)		6	SET
303.		Coupling		4	NO
304.	7	FUEL SYSTEM& LDO TANK:			
305.		Fuel filter (s)		6	SET
306.		LOVE JOY coupling		4	NO
307.	8	Booster & Gauging Water Pump			
308.		Repairing kit (inclusive bearings)		4	EACH
309.		Impeller each		4	EACH
310.		Shaft & sleeve		3	EACH
311.		8.3 SOURCE WATER PUMP-MECH (FOR 60 M3 /HR DISCHARGE MIN)			
312.		Valve seat		16	NO
313.		Valve Assembly		40	NO
314.		Liner		14	NO
315.		Piston assembly		20	NO
316.		Valve Spring		24	NO
317.		Piston rod		6	No
318.		VALVE COVER GASKET/LINER		24	EACH

		GASKET/ END PLATE GASKET ETC			
319.		HOSES / FITTINGS			
320.		2 inch hose , 3000 psi, length 12m min		4	NO
321.		3 inch hose ,NPT threaded nipple, 3000 psi, length 12m min		4	NO
322.		2 inch h.p. hose,7500psi rating, fitted with FIG1002 or FIG1003 Wing Union (both end), 12 m length min		2	NO
323.		3 inch h.P. hose,7500psi rating, fitted with FIG1002 or FIG1003 Wing Union (both end), 9 m length minimum		2	NO
324.		Low pressure Hoses of all sizes offered against the rig		2	SET
325.	9.10.5.1	EQUIPMENT The following equipment shall be supplied with each VFD rig:			
326.	9.10.5.1.1	DW/ MP/IRD AC Drilling motor		02	No.
327.	9.10.5.1.2	Blower unit (for drilling motor) (Used for AC drilling motors)		02	No.
328.	9.10.5.1.3	Soft starter (Used in PCR, starter panels)		01	No.
329.	9.10.5.1.4	Air Conditioner, Ex type (Used in Driller's Cabin)		01	No.
330.	9.10.5.1.5	Split Air Conditioner, Ex type (If installed in Dog House/ Tool Room)		01	No.
331.	9.10.5.1.6	100/75 HP (3 Ph.) FLP Motor (if used in the rig package for Super charger, mud mix, de-sander, de-silter etc.)		01	No.
332.	9.10.5.1.7	Mud agitator / water agitator motor (Used in Mud tank/ Water tank)		02	No.
333.	9.10.5.1.8	Lube oil motors (if used) (Used in Mud Pump / Draw Works)		01	No.
334.	9.10.5.1.9	40/30 HP motor (Used in Water booster pump)		01	No.
335.	9.10.5.1.10	Blower motor assembly for resistor bank (Used in Brake resistor bank)		01	No.
336.	9.10.5.2	DEVICES & CONSUMABLES The following devices & consumables shall be supplied with each VFD rig as spare (if used in offered rig as component):			
337.	9.10.5.2.1	Rotating rectifier assembly of each type (Used in Generator of Rig power pack)		01	Unit
338.	9.10.5.2.2	Exciter unit of each type (Used in Generator of Rig power pack)		01	Unit
339.	9.10.5.2.3	Diodes of rotating rectifier (3 fwd. + 3 rvs.) of each type (Used in		01	Set

		Generator of Rig power pack)			
340.	9.10.5.2.4	Movistor of each type (Used in Generator of Rig power pack)		03	No.
341.	9.10.5.2.5	Control fuses of each type / rating (Used in PCR, Drillers cabin, MP console)		10	No.
342.	9.10.5.2.6	Fuse holder set of each type (base and carrier) (Used in PCR)		02	No.
343.	9.10.5.2.7	Control switches of each type (Used in PCR, Drillers cabin, MP console)		01	Set
344.	9.10.5.2.8	Indicating meters of each type (Used in PCR, Drillers cabin, MP console)		01	Set
345.	9.10.5.2.9	Control pots of each type(Used in PCR, Drillers cabin, MP console)		01	Set
346.	9.10.5.2.10	Control relays of each type (Used in PCR, Drillers cabin, MP console)		02	Set
347.	9.10.5.2.11	Contactors of each type (Used in PCR, Drillers cabin, MP console)		02	No.
348.	9.10.5.2.12	Diodes for rectifier section (Used in VFD PCR)		02	Set
349.	9.10.5.2.13	Power fuse and control fuse for diodes (rectifier section) of each type/rating (Used in VFD PCR)		02	Set
350.	9.10.5.2.14	DC link components (if used) (Used in PCR)		01	Set
351.	9.10.5.2.15	Critical spare for rectifier unit (PCB of each type (if any), HMI) (Used in Rectifier panel at VFD PCR)		04	Set
352.	9.10.5.2.16	Critical spare for Inverter/ VFD unit module (PCB of each type, HMI) (Used in Inverter Panel at VFD PCR)		06	Set
353.	9.10.5.2.17	Power and control fuse for VFD inverter/ unit of each type/rating (Used in PCR)		06	No.
354.	9.10.5.2.18	Air circuit breaker/MCCB of each type (Used in PCR –Generator/ Rectifier/ Inverter/Transformer panels)		01	No.
355.	9.10.5.2.19	Control/relay module for air circuit breaker of each type (Used in PCR-Generator/Rectifier/ Inverter/ Transformer panels)		01	No.
356.	9.10.5.2.20	Generator Panel spares (PCB of each type, Fuse of each type) (Used in Generator panel)		02	Set
357.	9.10.5.2.21	Generator control module (Used in Generator panel)		02	No.
358.	9.10.5.2.22	PCB of each type for MPcon/synchronizing panel/Ground fault system (Used in MPcon/ Ground fault detection system/ synchronizing panel)		02	Set

359.	9.10.5.2.23	Control/ regulating transformer of each type (Used in PCR-Generator/Rectifier/ Inverter/Transformer / MPcon/ D'con/ Ground fault detection system)		01	No.
360.	9.10.5.2.24	MCCB for AC motor starters of each Type(Used in PCR starter/ feeder Panels)		01	No.
361.	9.10.5.2.25	Contactors for AC motors of each Type (Used in PCR starter/ feeder Panels)		01	No.
362.	9.10.5.2.26	Overload relays of each type (Used in PCR starter/ feeder Panels)		05	No.
363.	9.10.5.2.27	RCD of each type (Used in PCR starter/ feeder Panels)		02	No.
364.	9.10.5.2.28	Indication lamps of each type and colour (Used in PCR, D'con, MPcon)		10	Set
365.	9.10.5.2.29	HMI screen for Generator panel (Used in Generator panel)		02	No.
366.	9.10.5.2.30	HMI screen for monitoring (Used in PCR)		01	No.
367.	9.10.5.2.31	Selector switch of each type (Used in Generator panel/D'con/ MP console/Drives etc.)		10	No.
368.	9.10.5.2.32	Components of synchronizing system (Used in Synchronizing panel)		01	Set
369.	9.10.5.2.33	Electrical components of drillers cabin (PCB of each type, Switch of each type, Joystick, potentiometer etc.) (Used in Drillers cabin)		2	Set
370.	9.10.5.2.34	Soft starter of each type (Used in PCR)		01	No.
371.	9.10.5.2.35	Light fittings of each type (Used in Area illumination)		05	No.
372.	9.10.5.2.36	Bulbs/ tubes of each type (Used in Area illumination-LED type)		20	No.
373.	9.10.5.2.37	Plug and receptacle set of each type (Used in PCRs, D'con, MPcon, socket board of 250 KVA genset and isolation & lighting transformer hut)		12	Set
374.	9.10.5.2.38	PBS unit (Used in AC inductionmotors)		05	No.
375.	9.10.5.2.39	Emergency lamp (Used in PCR)		02	No.
376.	9.10.5.2.40	PCR anti panic lock set (Used in PCR)		02	No.
377.	9.10.5.2.41	Controller/ AVR for standby generator (Used in Standby genset panel)		01	No.
378.	9.10.5.2.42	Control transformer (if used) for standby generator (Used in Standby genset panel)		01	No.

379.	9.10.5.2.43	Control and power fuse of each type for standby generator (Used in Standby genset panel)		3	No.
380.	9.10.5.2.44	ACB for standby generator incomer (Used in PCR)		1	No.
381.	10.10.2 [A]	Rig Instrumentation System			
382.	10.10.2 [A] a.	Weight Indicator sensor		01	No.
383.	10.10.2 [A] b.	Mud volume sensor		02	Nos.
384.	10.10.2 [A] c.	Return flow sensor		01	No.
385.	10.10.2 [A] d.	SPM Sensor for Pumps		01	No.
386.	10.10.2 [A] e.	Pressure transducers – 01 no. of each type 1k, 5k & 10k as applicable		01	No.
387.	10.10.2 [A] f.	Y-Connector- Change over adapter – 01 no		01	No.
388.	10.10.2 [A] g.	Mud Density sensor		01	No.
389.	10.10.2 [A] h.	Mud temperature sensor		01	No.
390.	10.10.2 [A] i.	Encoder		01	No.
391.	10.10.2 [A] j.	RPM sensor		01	No.
392.	10.10.2 [A] k.	Torque sensor		01	No.
393.	10.10.2 [A] l.	Mud Conductivity Sensor		01	No.
394.	10.10.2 [B]	Online Gas Monitoring System			
395.	10.10.2 [B] a.	Gas detection sensor – LEL		01	No.
396.	10.10.2 [B] b.	Gas detection sensor - H ₂ S		01	No.
397.	10.10.2 [B] c.	Gas Control Card LEL		01	No.
398.	10.10.2 [B] d.	Gas Control Card H ₂ S		01	No.
399.	10.10.2 [B] e.	Weatherproof and flameproof Hooter cum Flasher		01	No.
400.	10.10.2 [C]	CCTV System			
401.	10.10.2 [C] a.	Camera		01	No.
402.	10.10.2 [C] b.	Cable used for Camera system		100	Meter
403.	10.10.2 [C] c.	Cable Glands		10	Nos.
404.	10.10.2 [C] d.	Connectors (Male and Female)		10	Sets
405.	10.10.2 [D]	Intercom /PA System			
406.	10.10.2 [D] a.	Intercom (Microphone and speaker)		01	No.
407.	10.10.2 [D] b.	Cables used for Intercom system		150	Meter
408.	10.10.2 [D] c.	Cable Glands		10	Nos.
409.	10.10.2 [D] d.	Connectors (Male and Female)		10	Sets
410.	10.10.2 [E]	Other Controls			
411.	10.10.2 [E] a.	All field sensors used for monitoring and control in Drawworks		01	Set
412.	10.10.2 [E] b.	All field sensors used for monitoring and control in TDS		01	Set
413.	10.10.2 [E] c.	All field sensors used for monitoring and control in Hydraulic Cathead		01	Set
414.	10.10.2 [E] d.	All field sensors used for monitoring and control in Iron Roughneck		01	Set
415.	10.10.2 [E] e.	All joysticks along with control cards in driller's cabin		01	Set

(nos. of rows to be added as per requirement)

PART –II :: COMMON MANDATORY SPARES FOR FIVE RIGS:

SL. NO.	CORRESPONDING TENDER SECTION/ CLAUSE	DESCRIPTION OF MANDATORY SPARE	PART NO, IF ANY	TOTAL QUANTITY REQUIRED AGAINST FIVE RIGS (A)	UOM
1.	4.1	Suction Module with Studs	-	8	NO
2.		Delivery Module with Studs	-	8	NO
3.		Suction Manifold of Mud Pump, 7500PSI rating	-	5	NO
4.		Discharge Manifold of Mud Pump (if applicable), 7500PSI rating	-	5	NO
5.	7	Pump Complete , Fuel Transfer	-	5	NO
6.		Pump Complete , LDO		5	NO
7.	9.10.5.3.1	VFD Inverter module (Used in VFD panel)		03	No.
8.	9.10.5.3.2	Alternator (600 VAC mentioned in section 9.2.1) (Used in Power Pack)		02	No.
9.	9.10.5.3.3	Alternator (415 VAC mentioned in section 9.9.1) (Used in Standby Power Pack)		01	No.
10.	9.10.5.3.4	Power transformer (600/415 VAC) (Used in PCR)		03	No.
11.	9.10.5.3.5	PLC/ SBC/PAC system spares (Used in Control Panel in PCR)		03	Set
12.	9.10.5.3.6	Air Conditioner of each type for PCRs (Used in PCR)		03	No.
13.	9.10.5.3.7	Special maintenance tools for the drilling motors (as recommended by motor OEM) (Used in VFD drilling motor)		2	Set
14.	9.10.5.3.8	Top Drive AC VFD Motor (Used in Top Drive)		01	No.
15.	9.10.5.3.9	Top Drive Blower Motor (Used in Top Drive)		02	No.
16.	9.10.5.3.10	Top Drive Hydraulic Motor (Used in Top Drive)		02	No.
17.	9.10.5.3.11	Top Drive Cables (From PCR to TOP Drive Unit) (Used in Top Drive)		01	Set
18.	10.10.3 a.	Data Acquisition System		03	Sets
19.	10.10.3 b.	Data Server		03	Sets
20.	10.10.3 c.	Workstation for DIC bunk house		03	Sets
21.	10.10.3 d.	HMI display monitor		03	Sets
22.	10.10.3 e.	UPS		03	Sets
23.	10.10.3 f.	Intercom/Public Address system Control Module		03	Sets
24.	10.10.3 g.	UPS for Intercom		03	Sets
25.	10.10.3 h.	CCTV system controller		03	Sets
26.	10.10.3 i.	CCTV Display Monitor		03	Sets

27.	10.10.3 j.	Gas Controller		03	Sets
28.	10.10.3 k.	UPS for Online Gas Monitoring system		03	Sets
29.	10.10.3 l.	Top Drive Control Module		03	Sets
30.	10.10.3 m.	Hydraulic Cathead Control Module		03	Sets
31.	10.10.3 n.	Iron roughneck Control Module		03	Sets

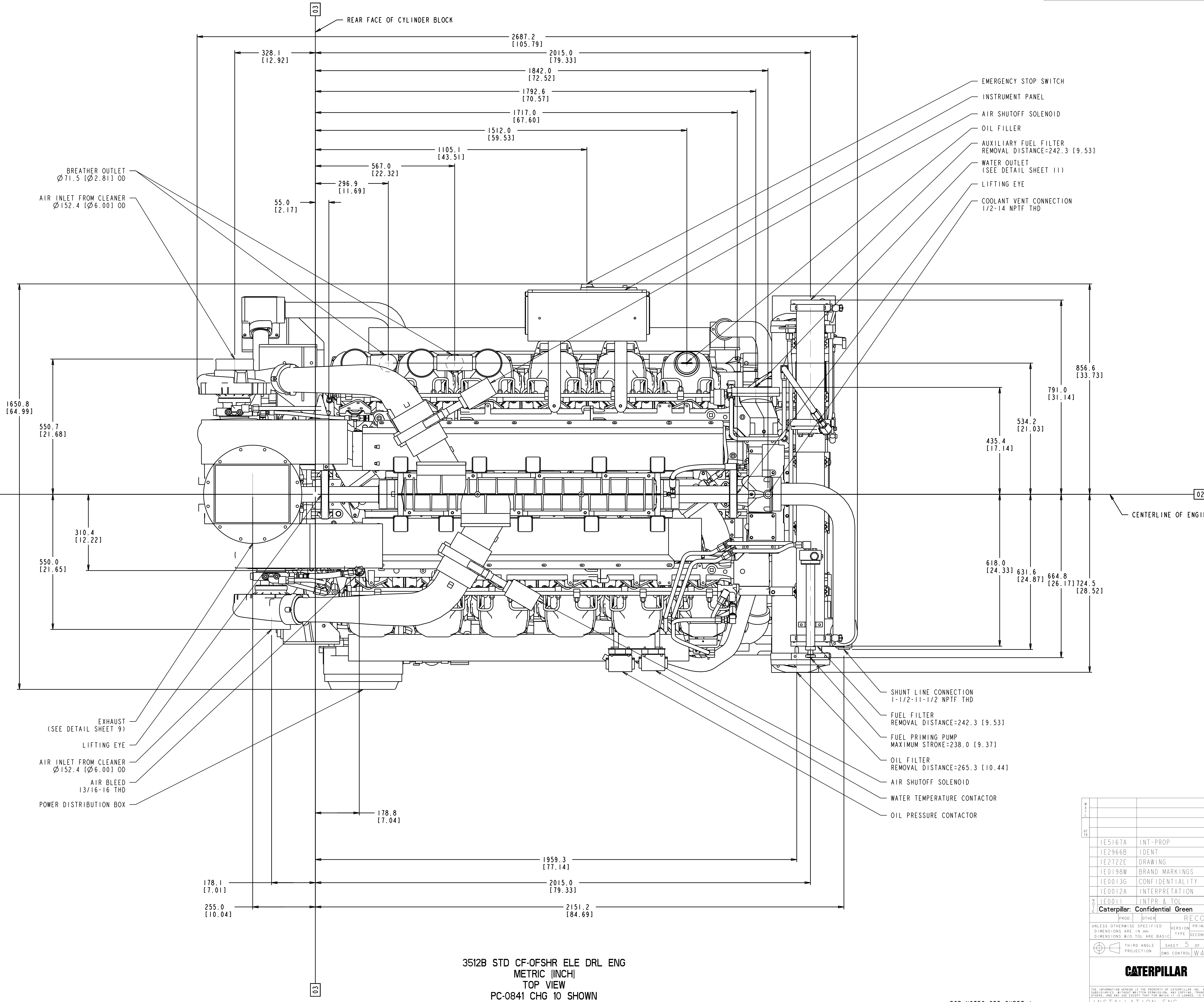
(nos. of rows to be added as per requirement)

APPENDIX – AA - VII

**RUNNING HOURS OF CATERPILLAR ENGINE FOR RETROFITTING – REFER
SECTION 5.1.A**

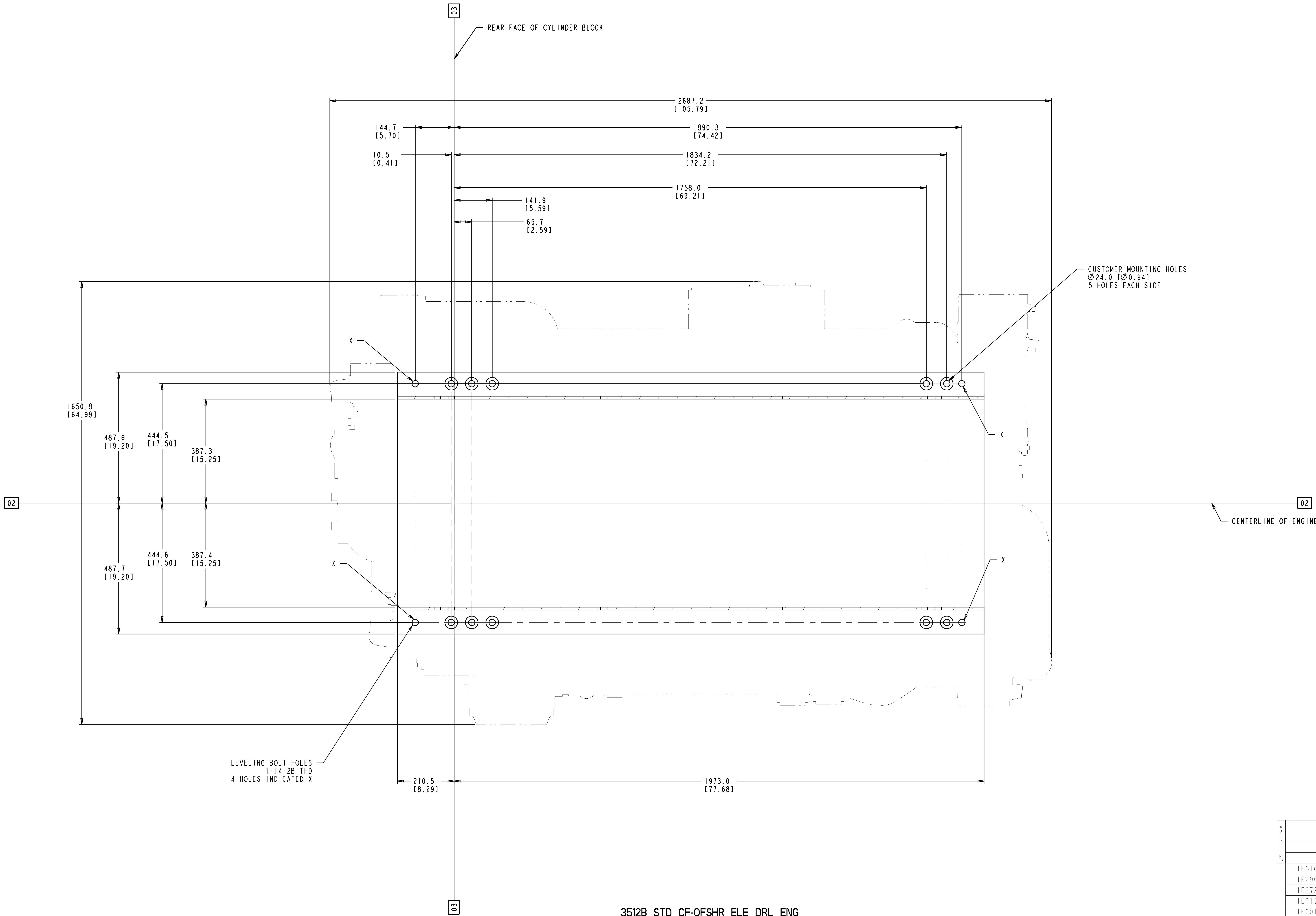
Sl. No.	Manuf. Sl no.	Sl. No.	Date of commissioning	Cumulative r/hrs ason 27.09.2020
1	ED300122	113970	01.08.2019	3393
2	ED300115	113310	31.01.2018	3488
3	ED300114	113309	31.01.2018	3538
4	ED300120	113307	31.01.2018	3794
5	ED300121	113308	31.01.2018	4193
6	ED300113	113314	30.12.2017	4615.3
7	ED300118	113312	30.12.2017	4727.3
8	ED300116	113313	30.12.2017	4954
9	ED300119	113311	30.12.2017	5110.6
10	ED300117	113323	26.04.2018	7938

APPENDIX-AA-VIII



3512B STD CF-OFSHR ELE DRL ENG
METRIC (INCH)
TOP VIEW
PC-0841 CHG 10 SHOWN

FOR NOTES SEE SHEET 1



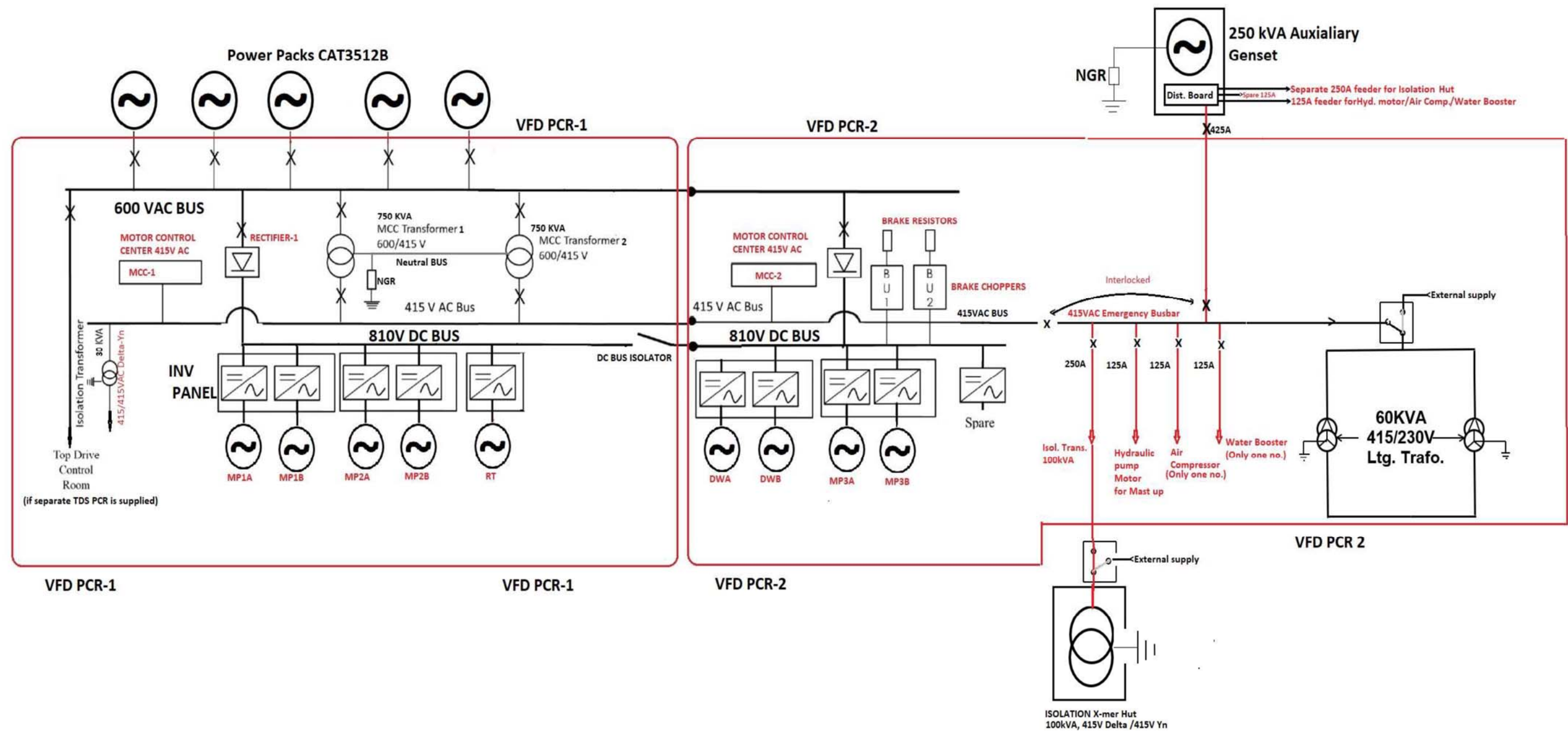
3512B STD CF-OFSHR ELE DRL ENG
METRIC (INCH)
FOOTPRINT
PC-0841 CHG 10 SHOWN
(DIMENSIONED OUTLINE VIEW FROM ABOVE)

W			
A			
L			
HT			
TR			
	1E5167A	INT-PROP	
	1E2966B	IDENT	
	1E2722E	DRAWING	
	1E0198W	BRAND MARKINGS	
	1E0013G	CONFIDENTIALITY	
	1E0012A	INTERPRETATION	
N	1E0011	INTPR & TOL	
S	Caterpillar: Confidential Green		
IE	PROD.	OTHER	RECORDS
	UNLESS OTHERWISE SPECIFIED	VERSION	PRIMARY X
	DIMENSIONS ARE IN mm	TYPE	SECONDARY
	DIMENSIONS W/O TOL ARE BASIC		
	THIRD ANGLE	SHEET 6	OF 11
	PROJECTION	DWG CONTROL	W407
CATERPILLAR			
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INSTALLATION-ENG			
(3512B OFFSHORE ELEC)			
471-8155			
VER. CHG			
Page 289 of 281			

FOR NOTES SEE SHEET 1

APPENDIX – AA - IX TYPICAL SINGLE LINE DIAGRAM

TYPICAL SINGLE LINE DIAGRAM (FOR REFERENCE ONLY)
HOWEVER, THE ELECTRICAL SYSTEM CAN BE DESIGNED BY OEM AS PER TENDER REQUIREMENT



APPENDIX – AA- X

ELECTRICAL - STATUTORY GUIDELINES

1. Classification of areas in oil mines into different zones according to the degree of probability of the presence of hazardous atmosphere, as given below (as per DGMS guidelines):

A. Drilling and Work-over Operations:

i. Well-head area :

- (a) When the derrick is not enclosed and the substructure is open to ventilation, the area in all directions from the base of rotary table extending up to 3.0 m shall be Zone 2 hazardous area. Any cellars, trenches and pits below the ground level shall be Zone 1 hazardous area; the area lying up to 3.0 m in horizontal direction from the edge of any cellars, trenches or pits and 0.5 m vertically above the cellars, trenches or pits shall be Zone 2 hazardous area.
- (b) When the derrick floor and substructure are enclosed, the enclosed substructure below the derrick floor, including cellars, pits or sumps below the ground level, shall be Zone 1 hazardous area; the enclosed area above the derrick floor shall be Zone 2 hazardous area.

ii. Mud Tank and Channel :

The free space above the level of mud in tank and channel shall be Zone 1 hazardous area; the area in a radius of 3.0 m in all directions from the edge of mud tank and channel shall be Zone 2 hazardous area.

iii. Shale Shaker:

- (a) The area within a radius of 1.5 m in all directions from the shale shaker to open air shall be Zone 1 hazardous area. The area beyond 1.5 m and up to 3 m in all directions from the shale shaker shall be Zone 2 hazardous area.
- (b) When the shale shaker is located in an enclosure, the enclosed area shall be Zone 1 hazardous area to the extent of the enclosure. The area outside the shale shaker and up to 1.5 m in all directions from the shale shaker shall be Zone 2 hazardous area.

iv. Degasser :

The area within a radius of 1.5 m from the open end of the vent extending in all directions shall be Zone 1; the area beyond 1.5 m and up to 3 m in all directions from the open end of vent shall be Zone 2 hazardous area.

v. Desander and Desilter :

The area within a radius of 1.5 m in all directions from the desander and desilter located in open air shall be Zone 2 hazardous area.

vi. Effluent Pit and Open Sump :

The free space above the level of flammable liquid within the effluent pit or sump shall be Zone 1 hazardous area; the free space lying up to 3.0 m in horizontal direction from the edge of any effluent pit or sump and 0.5 m vertically above the effluent pit or open sump shall be Zone 2 hazardous area.

2. OMR 2017, Clause 96(3)

No naked light or open flame or spark shall be permitted within thirty metre of any well or any place where petroleum is stored except with the permission of the manager as granted under sub-regulation (1) of regulation 94.