GLOBAL TENDER

FOR

PRE-BID TIE-UP (MoU) FOR ACVFD RIG EQUIPMENT FOR ONSHORE DRILLING OIL RIGS

Issued by:

Bharat Heavy Electricals Limited, RC Puram Hyderabad, India having registered office at

BHEL House, Siri Fort New Delhi-110049 and

also office at

Industry Sector, 6th floor, Integrated Office Complex, Lodhi Road,

NEW DELHI-110 003 (hereinafter referred to as 'BHEL')

INDIA

DISCLAIMER

All information contained in this document provided / clarified are in good interest and faith. The information contained in this document or subsequently provided to Bidder(s), whether verbally or in documentary or any other form, by or on behalf of BHEL, is provided on the terms and conditions set out in this document and such other terms and conditions subject to which such information is provided.

The purpose of this document is to provide interested parties with information that may be useful to them in the formulation of their application for qualification and submission of bids for the equipment and services. This is not an offer by BHEL to the prospective Bidder(s) or any other person. This document is neither intended nor shall it be construed as creating or requiring any ongoing or continuing relationship or commitment with any party or person. This document is issued for inviting bids to enter into a Pre-Bid agreement with successful bidder on mutually agreed terms and conditions.

Though adequate care has been taken in the preparation of this document, the interested firms shall satisfy itself that the document is complete in all respects. The information is not intended to be exhaustive. Interested Agencies are required to make their own enquiries and assumptions wherever required. Intimation of discrepancy, if any, should be given to the specified office immediately. If no intimation is received by BHEL by the date mentioned in the document, it shall be deemed that the document is complete in all respects.

The issue of this document does not imply that BHEL is bound to select and shortlist Bidder(s) to enter into any agreement(s) with any Bidder(s). BHEL reserves all right to reject any applications submitted in response to this tender document at any stage without assigning any reasons thereof. BHEL also reserves the right to withhold or withdraw the process at any stage. Neither BHEL nor its employees and associates will have any liability any loss, expense or damage which may arise from or be incurred or suffered in connection with anything contained in this document or any matter deemed to form part of this document, the information and any other information supplied by or on behalf of BHEL. BHEL accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance/use of any statements/information contained in this document by the Bidder. BHEL is not making any representation or warranty, express or implied, as to the accuracy or completeness of any information/statements made in this document.

The Bidder shall bear all its costs associated with or relating to the preparation and submission of its bid including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by BHEL or any other costs incurred in connection with or relating to its bid. All such costs and expenses will remain with the Bidder and BHEL shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by an Bidder in preparation or submission of the bid, regardless of the conduct or outcome of the tender.

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SECTION – 1

GENERAL REQUIREMENT

1.0 ABOUT BHEL

Bharat Heavy Electricals Limited (BHEL) is a Central Public Sector Enterprise, wherein Government of India is holding 63.06% of its equity. It is an integrated power plant equipment manufacturer and one of the largest engineering and manufacturing companies of its kind in India having a turnover of about USD ~3 billion. The company is engaged in the design, engineering, manufacture, construction, testing, commissioning and servicing of a wide range of products and services for the core sectors of the economy, viz. Power, Transmission, Industry, Transportation, Renewable Energy, Oil & Gas and aerospace & Defense with over 180 product offerings to meet the needs of these sectors.

Since its inception in 1964, BHEL has been the solid bedrock of evolution of India's Heavy Electrical Equipment industry. BHEL has a mammoth 20,000 MW per annum capability for manufacturing of power generation equipment. A widespread network of 16 manufacturing units, 2 repair units, 4 regional offices, 8 service centers, 4 overseas offices, 15 regional marketing centers corroborates the humongous scale and size of its operations. BHEL has extensive steel and aluminum fabrication facilities.

BHEL also has extensive experience in executing EPC projects in power plants and other industrial sectors. BHEL supplied equipment account for 60% of India's power generation, with an global installed capacity base of 185 GW (coal, lignite, nuclear, solar, hydro). BHEL has also served several overseas customers, with a global footprint in over 83 countries.

The high level of quality & reliability of BHEL products is a testimony to its adherence to international standards by acquiring and adapting some of the best technologies from leading companies in the world including General Electric, Siemens AG, Mitsubishi Heavy Industries Ltd. etc., together with technologies developed in its own R&D centers. BHEL invests more than 2.5% of turnover on R&D and innovation.

Experience of BHEL in Rigs Business :

At present, Oil rig equipment are being manufactured at two manufacturing facilities of BHEL situated at Hyderabad & Bhopal wherein mechanical equipment & fabrication work is carried out by Hyderabad and electrical equipment including motors & generators are manufactured at Bhopal. Complete assembly and testing of Oil Rig is carried out at the Rig-up yard facility at BHEL Hyderabad.

BHEL has established itself as an Original Equipment Manufacturer that designs, manufactures and services various types of AC SCR & AC VFD onshore Oil drilling rigs, mobile rigs and work over rigs. For over 3 decades, BHEL has supplied over 90 Oil rigs and has carried out refurbishment and up gradation of more than 40 rigs so far. Key offerings of BHEL include Onshore deep drilling rigs up to a depth of 9000 meters, Mobile rigs up to a depth of 3000 meters, Work-over rigs up to a well –depth of 6100 meters, Onshore drilling rig equipment like draw-works, rotary-table, travelling blocks, swivel, mast & substructure, mud-systems and rig electrics (SCR house, MCC house, cable interconnection package, DG Sets etc).

More details about the entire range of BHEL's products and operations can be obtained by visiting our web site www.bhel.com.

2.0 PURPOSE

2.1 This tender is issued specifically to address the AC VFD Rig requirement from M/S OIL India. The requirement covered in this tender is for 1 no. 3000HP VFD Rig equipment & services.

2.2 BHEL intends to offer complete AC rig package to M/s OIL, with a Pre-bid tie-up (MoU) finalized against this tender or as suited to BHEL.

2.3 The intent of this Tender is to invite applications from interested organizations/ companies who are willing to work with BHEL as per the broad scope indicated in **Annexure-1** and detailed technical specifications (Refer Section-3) of ACVFD rig equipment set.

2.4 Bidder(s) shall submit their bids in three parts i.e. Part-I (Documentation for Prequalification), Part-II (Techno-commercial bid) & Part-III (Price bid) within the due date for bid submission.

2.5 BHEL shall open Bid part-2 along with Bid part- 1 (in camera). BHEL shall shortlist the bidder(s) who meet the PQR (Part-1 bid) as per clause 4.0 for the intended Pre-bid tie-up.

2.6 After shortlisting of the bidder(s) from Part-1 bid, BHEL shall evaluate the Techno-commercial bid(s) (Part-2 bid) covering scope of supply and Commercial terms & conditions. These Part-2 bid(s) of only qualified bidder(s) against Cl. 2.4 above shall be evaluated.

2.7 BHEL shall evaluate Techno-commercial offers and may seek further clarifications on the bids submitted. After final evaluation of Part-2 (Techno-commercial bids of qualified bidders) by BHEL, Part-3 Price bids shall be opened in camera only of the bidders whose Part-2 Techno-commercial bids are found to be meeting BHEL tender requirements.

2.8 BHEL shall enter into MoU / agreement valid for a period of 1 (One) Year with the finally selected party (L1 bidder for the complete package). MoU / agreement shall be limited to specific tender from M/S OIL for which this tender is being issued. Validity of MoU may be extended beyond 1 (One) Year with mutual agreement.

This MOU may be considered for extension to such similar requirement with approval from competent authority.

3.0 GENERAL INSTRUCTION TO BIDDERS:

3.1 Bidders to prepare and submit the bids as per procedure given in Section-2 (ITB).

3.2 The details submitted by the bidders(s) shall be complete in all respects and BHEL may seek clarifications/additional information as considered necessary. Such clarifications / additional information must be provided within 5 days of BHEL request.

3.3 Any request for further information or clarification on the tender document may be submitted within 3 days from date of issue of tender.

3.4 Responses to tender are to be submitted in English only. Supporting documents, as required, should also be in English language. In case of some documents being available in languages other than English, the bidder shall necessarily provide duly authenticated translated version of the same in English.

3.5 Duly authorized representative of the bidder(s) shall sign on each page of the bid document.

3.6 Notwithstanding anything contained in this tender document, BHEL reserves the right to accept or reject any bid and to annul the tender Process in whole or part, at any time without any liability or any obligation for such acceptance, rejection or annulment, and without assigning any reasons thereof.

3.7 BHEL reserves the right to verify all statements, information and documents submitted by the Bidder in response to the tender. Any such verification or lack of such verification by BHEL shall not relieve the Bidder of his obligations or liabilities hereunder nor will it affect any rights of BHEL.

3.8 Bidders banned by BHEL & OIL are requested not to submit bids as their bids shall not be considered for evaluation. Also, bids from the bidders who takes the products/services of such

banned firms shall not be considered for evaluation. Lists of such banned firms is available on BHEL & OIL web sites

3.9 All costs incurred for participation in the tender shall be borne by the respective Bidder.

3.10 Within 30 days of signing of MoU with pre-bid partner, 1% of the value of MoU shall be taken from the Pre-bid partner as bid bond in the form of Bank Guarantee or security deposit etc.

3.11 BHEL shall place PO on the successful bidder after entering into MoU and receipt of order / contract from M/S OIL.

3.12 Cost of 4 years' operational spares & 4 years' AMC spares shall not be considered for evaluation of L1 Bidder. Such prices will remain valid for at least five (05) years from the date of commissioning of the Rig. PO for 4 years' operational spares & 4 years' AMC spares shall be placed separately in case of receipt of order for such spares from M/S OIL.

3.13 Bidder shall quote year wise AMC charges for 4-years after warranty period. The charges shall be considered for evaluation of L1 Bidder.

3.13 Additional information to be provided by Bidder for establishing bidder's experience as per Format given in **Annexure-3A & 3B**. Bidder to ensure to submit this information with Part-1 bid.

3.14 Bidder will provide name and contact information of respective personal/s to BHEL (upon request) for documents verification requirement.

3.15 Bidder shall submit copies of API Certificates valid at the time of bidding in favor 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.

3.16 Bidder may submit their application as per **Annexure -2** (along with supporting documents for Bid Part-I, Part-II & Part-3) by Post/Email at the following address:

The Purchase Officer / CMM
Vendor Complex
Purchase Co-Ordination Cell
Bharat Heavy Electricals Limited
R.C.Puram, Hyderabad Pincode – 502032 India.

Email: Part-1: technicalbid_hyd@bhel.in
Part-2: technicalbid_hyd@bhel.in
Part-3: pricebid_hyd@bhel.in
Phone: +91 40 23185290 (office), +91 9490746965 (mobile)

4.0 Pre-Qualifying Criteria (PQR):

The prospective pre-bid partner must meet all the following pre-qualification requirement (PQR) supported with relevant documents/ credentials/ certificates for further consideration.

Financial :

4.1 Bidder must meet following financial parameters:

4.1.1 Bidder shall have average turnover more than 200 Crores based on latest audited accounts for the last three consecutive financial year ending on 31st March (for financial years 2021-22, 2022-23, 2023-24) or 31st Dec (for financial years 2021,2022, 2023) as applicable for the Bidder

4.1.2 Bidder to submit last three consecutive years' (2021-22, 2022-23, 2023-24 for financial year ending on 31st March OR 2021,2022, 2023 for financial year ending on 31st Dec)

Balance sheet and profit & loss statement duly certified by a Chartered accountant or equivalent in the respective countries along with D&B report

Technical :

4.2 The Bidder must have valid API 8C for Top Drive components (Power Swivel) (for the facility from where supply of equipment is intended to be made) at the time of bidding. To be substantiated by documentary evidence with copies of API 8C.

Bidder's Response (meeting the above criteria): Yes/ No.
Supporting document attached: Yes/ No

4.3 Bidder must be an Original Equipment Manufacturer (OEM) for AC Draw works (3000 HP or higher), AC Top Drive (750Ton or higher) & Drilling Control system (includes driller's chair with Joystick and HMI, software and corresponding hardware to control Draw works, Top Drive, Mud Pump, VFD motors, Power System & VFD House. Bidder should have supplied minimum One (01) set of Draw-Works, Top Drive and Drilling Control System as package for Onshore 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 Fourteen (14) 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.

(Period as stated shall be reckoned from the date of opening of Bid Part-1). Bidder's experience of supplying one set of equipment as stated above, to be substantiated by documentary evidence as per Annexure-3A.

Bidder's Response (meeting the above criteria): Yes/ No.
Supporting document attached: Yes/ No

4.4 Bidder should also be a System Integrator of equipment like Iron Rough neck, Centralised HPU, Rig Instrumentation, AC Mud Pump, Hydraulic Power Slip, Hydraulic Cathead, Vertical Pipe Racker etc. and should have experience of integrating such systems at least 1 (One) no. in last 10 (ten) years (10 years' period as stated shall be reckoned from the date of opening of Bid Part-1). To be substantiated by documentary evidence with Experience List of contracts for rigs.

Bidder's Response (meeting the above criteria): Yes/ No.
Supporting document attached: Yes/ No

5.0 Undertakings to be submitted along with Bid Part-1

Bidder must furnish the following undertakings:

5.1 Bidders to whom with BHEL will enter into MoU/agreement shall not directly participate in the tenders issued by M/s OIL for 3000HP AC VFD Rig package or equipment. (Reference OIL E-Tender No. **SDG7023P25 dated 17.07.2024**).

5.2 Offered equipment shall be brand new, unused, of recent manufacture, not manufactured from recycled steel and free from any manufacturing defect.

5.3 Rig Equipment / Items shall be 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 Equipment/items (as applicable) along with the supply.

5.4 The bidder shall set up a base in India or train BHEL personnel to deal promptly with any technical issues arising during the normal warranty / guarantee period (as stated elsewhere in this NIT). Bidder should additionally confirm that they will depute their technical personnel at OIL's Rig site, Duliajan, Assam, INDIA for trouble shooting & providing timely warranty/guarantee repair/replacement/ operational & maintenance support services on the request of BHEL during the normal warranty / guarantee (as stated elsewhere in this NIT).

5.5 The bidder shall provide schedule of activities for completing the delivery and third party inspection of rig equipment within 21 days from the date of LOA/PO.

5.6 The bidder shall provide the maintenance / service / calibration facilities in India, for all the equipment / sub-component to be supplied under the contract.

5.7 The bidder shall indicate the source of their bought out items and also the names of the original equipment/materials manufacturer for the major components. The bidder shall guarantee the 'lifetime supply' (i.e. 7 years in case of electronic equipment/items and 10 years in case of mechanical equipment/items from date of successful commissioning of last rig) of spares for all the equipment to be supplied under the contract.

5.8 The bidder shall conform to provide AMC for 4 years from date of completion of warrantee period and Spares for life time (i.e. 7 years in case of electronic equipment/items and 10 years in case of mechanical equipment/items from date of successful commissioning) for the specified equipment being supplied under the contract thru BHEL.

5.9 Price of Four (04) years operational spares & four (04) years AMC spares will remain valid for at least five (05) years from the date of commissioning. Prices of these spares will not be considered for evaluation.

5.10 All future spares requirement of the equipment in scope of Pre-bid partner (Bidder) shall be routed thru BHEL for the Rig supplied to M/S OIL by BHEL against this tender. Bidder shall not directly supply such spares to M/S OIL.

5.11 Bidder to submit an undertaking from OEM of the equipment listed in **section 3.6** 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.

5.12 Bidder shall undertake assembling / installation and commissioning of supplied equipment in India at BHEL Hyderabad works and at the Rig location to the satisfaction of M/s BHEL & End customer M/s OIL. The broad scope of Installation and commissioning is provided at **Section 3.2 of this document**.

5.13 Bidder shall undertake training for Operation & Maintenance personnel as per the scope of work defined in the tender **Section 3.3 of this document**.

5.14 The bidder shall supply latest version of the all the software (software for operation, monitoring & troubleshooting from Server /Workstation /Configuration laptop) used in drilling control system/ instrumentation system/VFD etc., available at the time of delivery/ commissioning.

5.15 The control system software (software for operation, monitoring & troubleshooting from Server /Workstation /Configuration laptop) for drilling control system/ instrumentation system/VFD etc. shall be licensed to OIL with lifetime validity and the bidder will be responsible for any update in software and the software shall be made available (at no extra cost) to OIL for end of equipment cycle.

5.16 BHEL & Prebid partner finalized through this bidding process shall mutually discuss and agree on the list of equipment which may be required to be manufactured at BHEL in order to meet minimum 50% local content so as to avail PP-LC benefit.

5.17 Prebid partner shall have to ensure suitability of their equipment for installation onto Bootstrap type Mast & Box-on-box type Substructure to be manufactured by BHEL.

6.0 Experience requirement for other equipment/sub-assemblies in rig equipment

For other equipment/sub-assemblies in rig equipment for which bidder is not the manufacturer and has to outsource them, the bidder can either source/offer the equipment from the specified manufacturers listed at Section-3.6 (Vendor List) or source from any other manufacturer (including self) who satisfies following conditions:

Manufacturers of that particular equipment/sub-assemblies should have supplied 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 14 years from date of Part-1 bid opening.

Note: 1 (In case Bidder is OEM for the other rig equipment/sub-assembly of rig equipment then also above experience / supply condition to be satisfied by bidder)

Experience details in respect of above should be submitted as per attached format at **Annexure-3B** along with documentary evidence

Note 2:
Period(s) for qualification experience as mentioned in above clauses shall be reckoned from the date of opening of Bid Part-1 of this tender.

Annexure-1

BIDDER'S BROAD SCOPE (REFER SECTION – 3 FOR DETAILS)

Broad Scope of Supply & services to be provided by Pre-bid Partner :

1.0 Supply of 3000 HP AC Draw works system suitable for drilling depths of 30,000 ft. (To be mounted on Ground Platform)

2.0 Supply of AC Motor driven 750 Ton Top Drive system suitable for 7500 PSI working pressure along with Casing running tool.

3.0 Supply of Drilling Control System (Driller's cabin with Drill Chair, Joystick and HMI, control software and corresponding hardware) with minimum operation control of AC Top Drive, AC Draw Works, AC Mud Pump, VFD and Power System, Casing Running Tool, Hydraulic Cathead, Iron Rough Neck, Hydraulic Power slip, Vertical Pipe Racker, Centralized HPU .

4.0 Supply of Rig instrumentation system.

5.0 Supply of Power control rooms (AC VFD drives +MCC)

6.0 Supply of Iron Roughneck

7.0 Supply of Hydraulic Catwalk system

8.0 Supply of 1600/1700 HP AC Mud Pumps – 3 no's.

9.0 Supply of Power Slip

10.0 Supply of one no. IRD AC motor as per Section-3.1.8 under technical specifications

11.0 Supply of Commissioning spares and mandatory spares as per Section 3.8

12.0 Commissioning of bidder's supplied equipment and Integration of other equipment supplied by 3rd party (like Independent Rotary Drive System, Centralized HPU, Hydraulic Cathead, Iron Roughneck, , etc.,) with Drilling control system. BHEL shall provide resources (Crane, power, welding facilities etc.) including unskilled work force.

13.0 Training of BHEL / M/s OIL Engineers for the equipment to be supplied by pre-bid partner at OEM's training facility.

14.0 Supply of Spares thru BHEL for the equipment supplied by pre-bid partner.

15.0 Annual Maintenance Contract for the equipment detailed in section 3.9.

16.0 Installation & commissioning support for equipment detailed in section-3.2.

17.0 Supply of Detailed operation, maintenance & troubleshooting manuals

18.0 Bidder to quote spares for 4 years' normal operation for the equipment covered under AMC. Cost of these spares shall not be considered for bid evaluation.

19.0 Bidder to quote for 4 years' Operational spares (for equipment other than AMC equipment). Cost of 4 years' Operational spares shall not be considered for bid evaluation.

Annexure-2

Information to be submitted by Bidder with Part-1 bid

1. Name of the Company/Bidder:
2. Legal status of the Company: Public/Private/Incorporated/Govt./ etc.
3. Brief description of the Company including details of its business groups/subsidiaries/ affiliates:
4. Date of Incorporation:
5. Date of Commencement of Business:
6. Full address including Telephone nos. / Fax nos.: Registered Office:

   Head Office:

   Address for communication: Contact Details:

   Office Address in India, if any:

(Sign & Company Seal)

Authorized signatory

ANNEXURE-3A

Format for supply experience of 1 set of Equipment's

Sl. No.	BEC/ BRC Clause No.	Name of Offered Equipment (As applicable)				Past Supply Experience						Proof of execution				Remarks/ Additional details	
		Draw Works, Top Drive, Drilling Control System, VFD House	Make - Name & Address of Manufacturer	Technical Specification - (Capacity/ Size/Features etc.)	File/doc ref, page no etc. in the bid.	Customer Name & Address	Category of Customer (E&P Co./Drilling Contractor/ Drilling Rig Package Integrator/ Drilling Service Provider to OIL & Gas Industry)	Contract/ PO / MOU No. etc.	Date	Item Quantity	File/doc ref, page no etc. in the bid.	Reference no of End user certificate / Bill of Lading/ Consignee delivery receipt or challan/ Central Excise Gate Pass/Tax Invoice/ Commercial Invoice/ Payment Invoice	Date	Item Quantity	File/doc ref, page no. etc. in the bid.	Descripti -on	File/doc ref, page no etc. in the bid.

Authorised Person's Signature: _
Name: _____
Company: _____
Date:_____

Note:

a) Originals of documentary evidence are to be produced for verification on demand of OIL.
b) A job executed by a bidder for its own organization / subsidiary cannot be considered as experience for the purpose of meeting PQR.
c) Same company will be considered as same make.
d) The make, model, capacity and technical details of the Drilling Rig, Draw-Works, Top Drive, Drilling Control System and VFD House should be clearly indicated in the submitted documentary evidence.

ANNEXURE-3B

Format for supply experience of other Equipment's

Sl. No.	BEC/ BRC Clause No.	Name of Offered Equipment (As applicable)				Past Supply Experience						Proof of execution				Remarks/ Additional details	
		Other Rig Equipment listed	Make - Name & Address of Manufacturer	Technical Specification - (Capacity/ Size/Features etc.)	File/doc ref, page no etc. in the bid.	Customer Name & Address	Category of Customer (E&P Co./Drilling Contractor/ Drilling Rig Package Integrator/ Drilling Service Provider to OIL & Gas Industry)	Contract/ PO / MOU No. etc.	Date	Item Quantity	File/doc ref, page no etc. in the bid.	Reference no of End user certificate / Bill of Lading/ Consignee delivery receipt or challan/ Central Excise Gate Pass/Tax Invoice/ Commercial Invoice/ Payment Invoice	Date	Item Quantity	File/doc ref, page no etc. in the bid.	Description	File/doc ref, page no etc. in the bid.

Note:

a) Originals of documentary evidence are to be produced for verification on demand of OIL.
b) A job executed by a bidder for its own organization / subsidiary cannot be considered as experience for the purpose of meeting PQR.
c) Same company will be considered as same make.

---------- End of Section-1 ----------

SECTION – 2

INSTRUCTION TO BIDDERS (GENERAL TERMS & CONDITIONS)

(Attachment to Enquiry No. ..... Due on Date ..... For submission by 11.00 hrs to open from 14.00 hrs.)

INSTRUCTIONS TO BIDDER (ITB)

NOTE: Bidder to confirm in affirmative by typing "YES" or "Applicable Data" in the response column. Deviations , if any shall be recorded in deviations/comments column (Separate sheet can be attached if needed). Non deviatable clauses are indicated as "NON DEVIATABLE".

Sl. No.	DETAILED TERMS & CONDITIONS	VENDOR RESPONSE (YES/NO)	DEVIATIONS / COMMENT
1	**SCOPE OF SUPPLY:**		
	Signed & Sealed offers are invited for the Scope of Supply of **goods** and **Services** as detailed in the enquiry. Relevant enclosures/supporting documents / catalogue, if any shall be enclosed to the technical offer. Bidder can also submit offer through email at their own risk. The offer is to be submitted in three parts bidding system. Part-1 bid for Qualification of bidders to be submitted to mail ID technicalbid_hyd@bhel.in, Part-2 bid for Techno-commercial offer to be submitted to mail ID technicalbid_hyd@bhel.in, and part -3 ,price bid to be submitted to mail ID pricebid_hyd@bhel.in as an attachment only. Interchanging the information in the mails may lead to rejection of the offer. Supplier shall have no claim on e-mail offers sent on any other e-mail ID. In case of e-mail offers, the mail subject should contain Enquiry No. Due date and Supplier name, Supplier address including contact details shall be mentioned in the content of the mail. Without these details offer is liable for rejection.		
2	**GENERAL INSTRUCTIONS:**		
A	The quotation should be neatly typed and free from over writing/ erasures. Any correction or addition must be authenticated. The offer including annexures and brochures should be submitted in English /~~—~~Hindi. All Pages of Techno Commercial Bids (Main Pages), ITB should be signed and Stamped. If there is a conflict in case of bilingual submission, the submission in English will be final.		**Non Deviatable**
B	Bidders to please note that the Terms & conditions contained in this document and Special conditions, if any, are to be read fully before submission of quotations.		**Non Deviatable**
C	Vendors are advised to comply with specific conditions of the enquiry, Should there be any deviations (where deviations are permitted), it shall be entered in the deviation column. BHEL reserves the right to reject such offers or load the bid suitably for evaluation.		**Non Deviatable**

D	Offers shall be submitted directly, only by the Original Equipment Manufacturer or by their authorized representative and the offer should be in line with the regulatory guidelines (i.e A valid Agency agreement between principal vendor and agent / representative shall be attached and the agreement shall cover the scope of services rendered by Agent, Agency Commission and any other information called for as per the regulatory guidelines). OEM / Mill details shall be provided if supplier is not a manufacturer. Bid envelops shall bear the name of Supplier. In case of submission through authorized representative/agent, the name of representative/agent should also be mentioned apart from supplier name.		**Non Deviatable**
E	Offer received after the specified time and date of submission shall be rejected. No further correspondence shall be entertained.		**Non Deviatable**
3	**OTHER PARTICULARS (Please indicate applicable data)**		
A	Name of the Bid currency (freely tradable foreign currency for imports and Indian Rupees for indigenous purchase).		
B	Name of the Port of loading and Port of Discharge (applicable to imports).		
4	**BID SUBMISSION PROCEDURE:**		
A	**For Three-Part Bids :**		
i	Three part bid consisting of i) Pre-Qualification bid (PQR) – (Part-1), with all relevant documents for qualification of bidder & shall be kept in a separate sealed cover super subscribing Enquiry no. (PQR Bid Part-1) & due date. ii) Techno-commercial Bid – (Part-2), with all technical specification & scope including bill of material etc., and unpriced bid with all applicable Commercial Terms and Conditions, rates of agency commission , duties, taxes and other charges, except The price, super subscribing enquiry No. (Techno-Commercial Bid Part-2) and due date Signed and Stamped ITB and special conditions of contract, if any is required to be attached along with Techno-commercial Bid – (Part-2) iii) Price Bid (Part-3), containing ONLY the price (including agency commission, if any) and the applicable duties/taxes/other charges shall be kept in a separate sealed cover super subscribing Enquiry no. (Price bid Part-3) & due date. All these covers shall be kept in a fourth cover super subscribing Enquiry no. & due date.		**Non Deviatable**

ii	Part-1 PQR Bid and Techno commercial bids (Part-2 bid) will be opened on the assigned date. Techno commercial bids (Part-2 bid) of those vendors only who are qualified in Part-1 (PQR bid) will be evaluated. Price bid (Part-3 bid) of those vendors only who are qualified in Part-1 & 2 bids will be opened later on a specified date.		**Non Deviatable**
iii	The bidders whose Part-1 / Part-2 bids are not accepted will be informed.		
Iv	Bidders will be allowed to submit the impact on their quoted prices due to changes in technical scope, specifications, and commercial terms/conditions as specified in NIT which in the opinion of BHEL warrant changes in prices.		**Non Deviatable**
v	Bids shall be opened in camera on due time and date. No representative of bidder shall be permitted to attend the bid opening.		**Non Deviatable**
5	**Delivery Instructions**		
A	Indigenous Purchase		
	Goods shall be delivered on FOR Destination basis to the named destination(s) or as specified in the enquiry, Insurance in the scope of supplier.	**FOR INDIGENOUS BIDDERS**	
B.	Imports		
	The goods shall be delivered on FOB-basis up to nearest sea port / airport at the country of dispatch.		
6	**Documentation:**		
A	Indigenous Purchase		
	Following documents shall be submitted immediately on dispatch of material to BHEL HPEP / Site a. Original Tax Invoice (Refer ITB clause no 10 for Tax Compliance) b. Packing List - clearly showing number of packages, gross weight and net weight. c. Test/Warranty/Guarantee certificates, O&M Manual (If specified in SCC) d. Insurance intimation/declaration certificate e. Pre-dispatch Inspection report /Third Party Inspection Certificates. f. Consignee copy of LR signed & stamped by Customer/Site representative for DD Items g. e-waybill h. Any other documents as specified in SCC. Softcopies of the above documents shall be uploaded in Pradan portal https://hpep.bhel.com/mm	**FOR INDIGENOUS BIDDERS**	**Non Deviatable**

B	**Imports** i) Bidder shall inform BHEL the readiness of material along with packing details 30 days in advance from the date of delivery. For Hazardous cargo/DG cargo, supplier must provide the following documents prior to handing over shipment to freight forwarder, wherever freight is in BHEL scope: 1. Valid MSDS 2. DGD certificate with appropriate UN numbers. 3. Labelling and marking on DG cargo along with photo of packaging. 4. Self-declaration for consignment 5. Packaging Certificate as per DG Standards 6. TSA Approved Truckers details to be provided to forwarder at the time of shipment In addition to the above, supplier should ensure to comply all IATA DG regulations, if any new requirement is added in future. ii). Bidder shall also upload the soft copy of the dispatch documents consisting of BL / AWB, Invoice, delivery note, packing list, country of origin & Test certificates and other documents as specifically indicated in the SCC in PRADAN Portal (https://hpep.bhel.com/mm) within Five days from the B/L date for sea shipment and One day from AWB date for Air shipment and sent to email ids: mssea@bhel.in, msair@bhel.in, cmmfe@bhel.in. iii) AWB/BL must contain the information of BHEL GST no., and PAN no. iv) **Air Shipments:** Bidder shall ensure the following a) Port of discharge -- Mumbai/Chennai/Hyderabad (as indicated in SCC). b) Consignee shall be BHEL, Hyderabad. Material shall be air freighted through cargo mode only and not through Courier.		

	c) Upon handing over the cargo to the forwarder, bidder shall ensure the acknowledgement receipt with wordings" Cargo handed over in sound condition for Air freighting". Note: Warehouse receipt will not be considered for penalty calculations. d) In case of CIF/ shipments, bidder shall also inform BHEL the information about discharge port agent details and cargo arrival information within one day from the date of Shipment. e) Following dimensions of single package may be noted. i). Maximum dimension of the cargo(ODC) -- 125" x 88" x 63" ii). Maximum weight of the cargo -- 3.5 MT. If any package dimension or weight exceeds the above set limits, it will be treated as Over Dimension Cargo (ODC) or Over Weight Cargo and bidder shall inform BHEL 30 days in advance to the delivery date to enable BHEL to finalize the freight forwarder. f). If package falls under Hazardous category, bidder shall communicate BHEL 30 days in advance period with document support. v) **Sea Shipments:-** Bidder shall ensure the following a). Port of discharge – Nhavasheva Mumbai/Chennai. b). Place of Delivery / Final Destination for CIP shipments - Nhavasheva CFS / Chennai CFS. c). In case of FOB shipments, bidder shall handover the material to BHEL nominated forwarder and obtain the cargo receipt. d). If the material cannot be containerized in 20 or 40 GP containers, an advance information of 30 days prior to the delivery date shall be communicated to BHEL for necessary arrangements and finalization of freight forwarder. e). For CIP shipments 1. In case of FCL shipments, Detention free period must be 14 days. 2. Bidder shall also inform BHEL the information about discharge port agent details and cargo arrival information within 5 days from the date of Shipment. 3. No charges for the services rendered till place of destination will be payable by BHEL. Incase liner / forwarder insist for charges, not in the scope of BHEL, the same will be adjusted from bidder account. and NIT.		

4. In case of CIF shipments -- Bidder must select a forwarder/liner whose discharge port published tariff for THC and other services is available. Any charges over and above the published tariff will not be borne by BHEL or will be adjusted from the bidder's bill.
5. bidder must insure the cargo for 110% of material value including the freight amount.

(vi). Recovery charges for non-submission of documents: -

Bidder shall submit all the required documents to BHEL as prescribed in the Purchase order and NIT.

If BHEL incurs any charges such as Penalty, demurrage, container detention, wharfage, storage, Ground rent etc., due to non - compliance / non - submission of documents prescribed in Purchase Order/ NIT/Letter of credit, the same shall be recovered from the bidder as under:

1. EUOPE/USA/Black Sea/ Far East/Middle East/ South East sector

A. **For FOB Sea Consignments:-**

Penalty for late submission / negotiation of documents beyond 14 days shall be as under:

Sl. no	Period (From Date of Bill of Lading)	Recoverable Charges	Recoverable Charges per day per container	
		LCL per week/ Break bulk cargo per day	20FT Container	40FT Container
i	Upto 14th day	Nil	Nil	Nil
ii	15th day onward	USD 10	USD 110	USD 200

B. For CIP Sea Shipments: -

Bidder shall provide rates for detention charges after free period at the time of offer itself in case of engagement of 20FT Container and 40FT category. In case of late presentation of documents to the bank recovery will be effected from the Bidder as per the rates quoted by the Bidder at the time of offer in this regard.

In case of Break bulk cargo and LCL, Demurrage charges shall be recovered at the rate of USD 1 per Ton per day and storage charges at the rate of USD 10 per week respectively shall be charged as late presentation charges.

(vii) Description of items in invoice, packing list, BL / AWB or LR shall be same as PO item description. Bidders shall ensure that invoice shall contain PAN nos. of both bidder and BHEL along with other tax related numbers. BHEL PAN AAACB4146P and BHEL TAN HYDB00086C Any other additional documents sought by the statutory authorities, the same shall be produced by the bidder on priority basis.

	(viii) Bidder shall provide package details including number of packages, gross weight, net weight etc. (ix) The bidder shall provide the following documents at the time of submission of offer: a) No Business Connection in India declaration issued by the bidder as per the format specified. (or) b) (i) No Permanent Establishment in India declaration issued by the bidder as per the format specified. (ii) Tax Residence Certificate issued by the bidder's tax authorities. (iii) Form 10F, as attached in Annexure V, to be issued by the bidder. c) In case the bidder has a Business Connection in India as per Section 9 of Income Tax Act or significant economic presence in India as per rule 11 UD of IT Act or Permanent Establishment in India as per Article 5 of Double Taxation Avoidance Agreement between India and the bidder's country,		
7	Delivery Schedule		
A	Refer **Section-4** of tender document for detailed delivery schedule expected by BHEL from bidder. The tendered goods shall be delivered within the period stipulated in PO . Delivery **at BHEL** can be accepted at the earliest**,** 30 days prior to delivery date as mentioned in the Purchase order. Delivery **earlier than** 30 days of contractual delivery date may be accepted with the written permission of BHEL –Purchase department. Goods ready for dispatch after the delivery date will be accepted only with the prior written permission of BHEL.		**Non Deviatable**
B	Documents such as Test Certificate, Guarantee Certificate, Inspection reports are to be submitted within 10 days of dispatch of the materials or as mentioned in PO / LC. Supply of plant/ equipment/ stores shall not be considered complete until they have been inspected and accepted at the place and destination specified for delivery by the time stipulated under the terms & conditions of the Order/ Contract. Mere payment by itself		
8	**Pricing Terms**		
	Prices once quoted shall remain firm and valid during the execution of PO / MoU. Offers with PVC will be rejected outright.		**Non Deviatable**
9	**PRICE VALIDITY :**		

	Unless otherwise specified, offer shall be valid for a period of 180 days from the date of Part-1 bid opening date for entering into MOU / Pre-bid tie-up. Rates in the MOU / Pre-bid tie-up shall remain unchanged till the validity of MOU or the delivery of last equipment as per PO placed by BHEL within validity period of MOU. Price of Four (04) years operational spares & four (04) years AMC spares will remain valid for at least five (05) years from the date of commissioning.		
10	**Taxes & Duties (RATE TO BE INDICATED by the bidder against the space provided)**		
A	**Indigenous Purchase**		
	i) Only valid GST registered bidders will be considered for the tender. The GSTIN of the bidder should be clearly mentioned in the offer. ii) If bidder is exempted from GST registration under any provision of the GST Law, a declaration with due supporting documents should be furnished for considering the offer. iii) Bidder to quote the applicable taxes in the following manner: - Harmonized System of Nomenclature (HSN) of Goods - Services Accounting Code(SAC) of Services. - IGST/CGST/SGST/UTGST: Rate of Tax to be quoted as extra in % against the space provided iv) Bidders to ensure correct applicability of IGST/CGST/SGST/UTGST based on the Inter / Intra state movement of goods/services. v) In case Bidder has opted for GST Composition Scheme, the same may be stated explicitly both in their technical and price bids. An undertaking to the effect that any change in the status of the bidder will be intimated. vi) Any other taxes & duties not covered anywhere above may be indicated separately. **Taxes deducted at source:** - TDS as per the extant statutes shall be deducted. - In case bidder does not provide PAN details, higher rate of tax shall be deducted as per the Act. - Concessional certificates, if any, should be provided well in time for lower deduction of tax		

Terms & Conditions to be complied

1. All invoices (incl. Credit Notes, Debit Notes) to contain BHEL HPEP GSTIN ie 36AAACB4146P1ZG. Invoices submitted should be in the format as specified under GST Law. All details as mentioned in Invoice Rules including Dealer GST registration number (GSTIN), invoice number with date of issue, quantity, rate, value, taxes with nomenclature – CGST, SGST, UGST, IGST mentioned separately, HSN Code / SAC Code etc.
2. Reimbursement of GST amount will be made only upon completion of the following:
   i. Bidder declaring such invoice in their GSTR-1 Return/ IFF
   ii. Receipt of Goods or Services and Submission of Tax invoice by BHEL
   iii. The tax invoice is reflected in the GSTR2B of BHEL, HPEP (buyer). Payment of GST will be made only if it is matching with data uploaded by the Bidder in GST portal.
3. In case of discrepancy in the data uploaded by the bidder in the GSTN portal vis-a-vis the tax invoice or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit. The same would be available in PRADAN Portal for the bidder's information. Bidder has to rectify the data discrepancy in the GSTN portal or issue credit note or debit note (details also to be uploaded in GSTN portal) for the shortages or rejections in the supplies or additional claims for processing of such invoices.
4. In cases where invoice details have been uploaded by the bidder but failed to remit the GST amount to GST Department within stipulated time, then GST on the invoices in default will be recovered from the bidder along with the applicable interest.
5. In case GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, such GST amount will be recoverable from bidder along with interest levied/leviable on BHEL.
6. GST TDS deducted as per GST Act, is uploaded in GSTN portal along GSTR7. Bidders can directly download the GST TDS Certificate from the GSTN Portal.
7. Bidders to note that Rules & Regulations pertaining to E-way bill system are to be strictly adhered to, as and when notified by Govt. authorities.
8. Vendors who fall under the E-Invoice regulations, i.e., having an annual turnover of Rs. 10 crores (Rs 5 crore w.e.f 01.08.2023) in the previous year shall issue e-invoice in line with Rule 48(4) of CGST Rules failing which GST amount will not be reimbursed to the vendor even if the other requirements are fulfilled.
9. In case the vendor is exempted by the GST department under the Rule 48(4) of CGST Rules from issuing E-invoice, a declaration as prescribed in the Notification 17/2022 - Central Tax dated 01-08-2022 shall be provided on the invoice.
10. Vendors who do not fall under the E-Invoice regulations, i.e., whose annual turnover is less than Rs. 10 crores (Rs 5 crore w.e.f 01.08.2023) in the previous year have to give an undertaking indemnifying BHEL that the vendor is not falling under the E-invoice requirement category and that in case of any breach of this E-invoicing requirement, the vendor indemnifies BHEL of any consequences that may arise due to such a breach.
11. No GST shall be levied on liquidated damages / penalty.

B.	**Foreign Purchase (Imports)**		
	The offered price shall be inclusive of all the Taxes and duties as applicable in country of export / country of dispatch for the quoted price. Taxes deducted at source: a. In case of goods or services subject to Income tax in India, such tax as per the extant statute shall be recovered. b. In case bidder does not provide necessary documents for beneficial taxation (Refer clause 6- B-(ix) a-c of ITB), the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act.		**Non Deviatable**
11	**Payment Terms: Unless otherwise specified in Special Conditions, following shall be the terms of Payment.**		

A	**Indigenous :** 1) 80% payment along with taxes, freight & insurance will be made within 90 days from the date of receipt of materials complete with documents as per PO. However payment would be done only after receipt of original documents, including site/ **Customer** acknowledgement on LR (MRC – Material Receipt Certificate at site) / GR clearance at BHEL Stores. 2) Balance 20% payment for material portion shall be released within 90 days after satisfactory commissioning of equipment at M/S OIL Site after issuance of "Work Completion Certificate" by M/S OIL. 3) 100% for service charges for installation and commissioning against "Work Completion Certificate" issued by OIL within 90 days of the Invoice date for completed portion of service. 4) 100% for service charges for training against "Work Completion Certificate" issued by OIL within 90 days of the Invoice date for completed portion of service. 5)100% charges for AMC service against "Work Completion Certificate" issued by BHEL within 90 days of the Invoice date for completed portion of service on quarterly basis after completion of specific quarters. For MSEs (covered under MSME Act) which are registered and periodically renewed with BHEL, this period will be 45 days* as prescribed in the relevant act. MSE benefits are not applicable to Traders/Wholesalers registered as MSEs **Adherence to the above time schedule of payment is contingent upon Vendor complying with GST provisions and availing of Input Tax Credit by BHEL before the date of payment**. *The taxes and duties that are reimbursed would be the ones applicable as on the contractual Purchase Order delivery date or the amount actually paid whichever is less. **In case GST credit is delayed/ denied to BHEL, due to non/delayed receipt of goods and/or tax invoice or expiry of timeline prescribed in GST Law for availing such ITC, or any other reason not attributable to BHEL, GST amount shall be recoverable from Vendor along with interest levied/ leviable on BHEL.**	**FOR INDIGENOUS BIDDERS**	

B	**Import of Goods and Services :-** i) 80% payment for material portion (less Indian Agency Commission, if any) shall be paid **through Usance Letter of Credit with a credit period of 90 days.** ii) Balance 20% payment for material portion shall be released thru Wire transfer within 90 days after satisfactory commissioning of equipment at M/S OIL Site after issuance of "Work Completion Certificate" by M/S OIL. iii) LC will be opened after successful completion of pre dispatch inspection prior to the scheduled / **agreed** delivery date. **LC request may be forwarded by vendor 30 days prior to readiness**. iv) 100% for service charges for installation and commissioning against "Work Completion Certificate" issued by OIL within 90 days of the Invoice date for completed portion of service thru Wire Transfer / E-payment. v) 100% for service charges for training against "Work Completion Certificate" issued by OIL within 90 days of the Invoice date for completed portion of service thru Wire Transfer / E-payment. vi) 100% charges for AMC service against "Work Completion Certificate" issued by BHEL within 90 days of the Invoice date for completed portion of service thru Wire Transfer / E-payment on quarterly basis after completion of specific quarters. vii) In case BHEL considers any deviation in payment terms i.e. early payment based on vendor's request, then bids shall be evaluated with loading as per Clause-16 E.		
C	No advance payment is acceptable.		**Non Deviatable**
D	**Performance Bank Guarantee (PBG)**: Supplier to submit Performance bank guarantee @10% of the purchase order value (for the ordered lot value) within 30 days from the date of PO. The PBG should be valid for 90 days beyond the warrantee period.		
E	**Conditions for both Indigenous & Foreign Bidders:** i) In case Bidders insist for lesser Credit period and BHEL accepts, a loading of 0.60% for every 15 days reduction will be applicable. ii) In case PBG as required is not furnished, Payment will be released deducting the BG amount, which will be paid after expiry of warranty period against submission of supplementary claim. iii) Payment does not imply in any respect whatsoever a waiver of Buyer's right to performance of the Order. Buyer is entitled to set off claimable debts against claimable liabilities with the bidder by means of a setoff Note.		

12	**Penalty clause:** **a)** Penalty shall be 0.5% of the total order value per week of delay or part thereof, subject a maximum of 7.5% of the total order value on agreed delivery schedule/milestones for completion of material supply including spares. Total order value for above shall be order value for Material supply including spares. Rig wise material delivery are mentioned in Delivery schedule at Section-4 of this tender document. **b)** Penalty shall be 0.5% of the total order value per week of delay or part thereof, subject a maximum of 7.5% of the total order value on agreed schedule/milestones for completion of Installation, Commissioning & Training of M/S OIL personnel. Total order value for above shall be for Material supply including spares, Installation & Commissioning and Training of M/S OIL personnel. Rig wise Lot sizes for Installation, Commissioning & Training are mentioned in Delivery schedule at Section-4 of this tender document. **c)** Maximum applicable penalty for (a)+(b) above shall be 0.5% of the total order value per week of delay or part thereof, subject a maximum of 7.5% of the total order value. Total order value for above shall be for Material supply including spares, Installation & Commissioning and Training of M/S OIL personnel.		
13	**Excess materials** supplied beyond tolerance limit as specified in PO will not be paid and bidder may raise credit note for the excess/unaccepted material as per GST law.		**Non Deviatable**
14	**Rejected materials,** if any, shall be collected by the bidder within 90 days of such communication to the bidder. Beyond this period the bidder forfeits their right to the materials.		**Non Deviatable**
15	**Guarantee / Warranty Period :** (Deviation to this clause is not acceptable.) Wherever required, and so provided in the specifications/Purchase Order, the seller shall guarantee that the goods supplied shall comply with the specifications laid down, for materials, workmanship and performance. If within the guarantee period, the delivery is found to be non-complaint, the seller shall on his own account, replace repair, or re-execute the delivery at Purchaser's discretion on the purchaser's first request or within the mutually agreed period, without prejudice to Purchaser's other legal rights. If the seller continues to default on their obligations, purchaser has the right to proceed to replace, repair or re-execute the order at the seller's expense, with or without help from third parties. Purchaser shall notify the seller of the exercise of this right in advance where ever possible. Unless otherwise specified, guarantee period shall be 12 months from the date of successful commissioning of Rig at M/S OIL site (Deviation is not acceptable for Period of 12 months). The guarantee period shall be extended by the period during which the goods are not in compliance. A guarantee period as described above shall apply afresh to replaced, repaired or re-executed parts of a delivery. Supplier shall depute their service personnel to attend the Guarantee and warrantee issues within 7 days of intimation by BHEL.		**Non Deviatable**

NOTE: Deviations (Commercial as well as Technical) from the tender specifications and conditions are generally not acceptable. However, deviation if any, shall be brought out clearly with proper justification in the offer. The deviation, if considered by BHEL, shall be loaded for comparison, while evaluating the offer. If a bidder unconditionally withdraws any deviation before price bid opening, the same shall not be loaded. Loading criteria in respect of major commercial conditions where deviations if any are accepted shall be as per clause No.16.

The Bidders may specifically note the following.

16 **Price Bid Evaluation and Loading Criteria :**
(Refer Section-5 of tender document for Price bid format & other details) :

i) Evaluation Currency for this tender shall be "INR". ii) Evaluation of prices shall be done item-wise unless otherwise specified in the SCC.
iii) Evaluation shall be on the basis of delivered cost, i.e. "Total Cost to BHEL" w.r.t the finalized technical scope and commercial conditions (after considering incidence of applicable taxes and duties and loading). iv) In the course of evaluation, if more than one Bidder happens to occupy L1 status, effective L1 will be decided by soliciting discounts from the respective L1 Bidders. In case more than one Bidder happens to occupy the L1 status even after soliciting discounts, the L1 Bidder shall be decided by a toss/draw of lots, in the presence of the respective L1 Bidders or their representatives. Ranking will be done accordingly. BHEL decision in such situations shall be final and binding.

INDIGENOUS

a. Bidder shall ensure to indicate the applicable taxes against each line item, failing which the same will be considered as inclusive/NIL.

b. Ex-works offers received (as against FOR Destination mentioned in enquiry) shall be loaded by 2% of Ex-works value.

c. GST and any other charges quoted will be added to the base price. However, in case input credit is available for GST (SGST, CGST/IGST), the same shall be excluded for arriving at "Total Cost to BHEL"

IMPORTS

For evaluation of offers in foreign currency, exchange rate (TT selling rate of State Bank of India) as on the date of bid opening (Part-I, in case of two-part bids) shall be considered. If the relevant day happens to be a bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken.
In case of foreign Bidders, the quoted CIP price shall be loaded by the following factors to arrive at "Total Cost to BHEL":
- Import duty as applicable on the date of Part-I bid opening.
- Loading will be as per the table below

	Ex-Works	FOB/FCA	CIF/CFR	CIP
Foreign Inland freight and insurance	2%			
Marine freight and marine insurance	3%	3%		
Destination Port handling charges	0.50%	0.50%	0.50%	
clearing charges & inland freight and insurance	2%	2%	2%	2%

COMMON LOADING FOR IMPORTS & INDIGENOUS that will be added for arriving the "Total Cost to BHEL"

A. Loading on Deviated Penalty clause shall be 7.5% or to the extent to which the bidder has opted for deviation.

17 Procurement directly from the manufacturers/ suppliers shall be preferred. However, no agent shall be allowed to represent more than one manufacturer/ supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer/ supplier or the manufacturer / supplier could bid directly but not both. In case bids are received from both from the manufacturer/ supplier and the agent, bid received from the agent shall be ignored.

18	**RIGHT OF REJECTION /NON- PLACEMENT OF PO:** BHEL reserves the right to accept or reject any or all bid/s in full or part without assigning any reason whatsoever.
19	**INTEGRITY PACT** Bidders shall have to enter into Integrity Pact with BHEL as per **SECTION 6** - for Tender value of rupees two crores and above and shall be signed by the authorized signatory along with the offer, failing which Bidder's offer will be rejected.
20	**Public Procurement**
A	**Make in India** For this Procurement, the local content to categorize a bidder as a Class I local bidder / Class II local bidder / Non-Local bidder and purchase preference to Class I local bidder, is as defined in Public Procurement (Preference to Make in India) order No P-45021/2/2017-PP(BE-II) dated 04-06-2020 issued by DPIIT as amended from time to time. Proforma for self-certification for minimum local content and auditor's certification is given in Annexure III.
B	Any Bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with competent authority. GOI website https://www.mea.gov.in/ to be referred for latest details of competent authority and exemptions . Proforma for self-certification for compliance is given in Annexure IV.
C	**Startups:** For Start-ups duly registered with DPIIT (Copy of certificate to be provided), condition of prior turnover and prior experience in Public Procurement may be relaxed subject to meeting of Quality and Technical Specifications. Startups are exempt from paying EMD.
21	**Benefits earmarked for Purchase from Micro & Small Enterprises (MSEs) – Indigenous Purchase**
A	All Micro and Small Enterprises (MSEs) as defined in MSE Procurement Policy are exempt from Paying EMD. NSIC/UDYAM registered bidders shall submit NSIC/UDYAM Certificate along with bid documents. Date to be reckoned for determining the deemed validity will be the last date of Technical bid submission. Non- submission of such document will lead to consideration of their bid, at par with other bidders and MSE status of such bidders shall be shifted to Non- MSE Category till the bidder submits these documents.
B	In tender, MSEs quoting price within price band of L1+15% shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price is from someone other than a MSE and such MSE shall be allowed to supply at least 25% of total tendered value. In case of more than one such MSE, the supply shall be shared proportionately. Out of these 25% minimum 3% shall be earmarked for MSEs owned by women and 6.25% for MSEs owned by SC/STs who submit the relevant documents.
C	If an enterprise falling under MSME category as defined in the Act, graduates to a higher category from its original category or beyond the purview of the Act, it shall continue to avail all non-tax benefits of its original category notified by the Ministry of Micro, Small and Medium Enterprise for a period of three years from the date of such graduation to the higher category.
D	BHEL HPEP is registered with RXIL (TReDS) platform. MSME bidders are requested to get registered with RXIL (TReDS) platform to avail the facility as per the GOI guidelines.
22	Inspection Measuring and Test Equipment (IMTE) used by the Bidder/ Contractor or sub-contractor shall be calibrated, maintained and controlled. Calibration shall be valid and IMTE maintained in sound condition during usage.
23	ISO-9001, ISO14001 & OHSMS 45001 shall be complied.
24	If BHEL registered supplier is not quoting against this NIT, supplier shall send regret letter positively with valid reasons for not participating. Repeated lack of response on the part of supplier may lead to deletion of such registered supplier from BHEL's approved supplier's list as per BHEL SEARP Guidelines.

25	Any other terms and conditions of the bidder attached / referred against the tender enquiry will not be considered.
26	All drawings, patterns and tools supplied by BHEL or made at BHEL's expense are BHEL's property. These cannot be used or referred to any other party and must be used only in the execution of BHEL's orders.
27	Any amount payable by the bidder under any of the conditions of this contract shall be liable to be adjusted against any amount payable to the bidder under any other work / contract awarded by BHEL HPEP or any other BHEL Units. This is without prejudice to any other action as may be deemed fit by BHEL.
28	The bids of the bidders who are on the banned list and also the bids of the bidders, who engage the services of the banned firms, will be rejected. The list of firms banned by BHEL is available on BHEL web site: www.bhel.com
29	**Ordering and confirmation of order after Pre-Bid Tie up (MOU)**
	The bidder shall send the order acceptance within one week from the date of LOI/Purchase order or such other period as specified/agreed by the Buyer. Buyer reserves the right to revoke the order placed if the order confirmation differs from the original order placed. Buyer shall be legally bound, only if agreed for any deviation explicitly in writing. The acceptance of deliverables or supplies by Buyer as well as payments made in this regard shall not imply acceptance of any deviations. The Purchase order will be deemed to have been accepted if no communication to the contrary is received within one week (or the time limit as specified /agreed by the Buyer) from the date of P.O. Buyer, is at liberty to send signed P.O. through electronic media such as e-mail and the receipt of which shall be treated as receipt of order.
30	**Execution**
	The whole contract is to be executed in the most workman like manner, substantial and approved as per the contracted terms.
31	**Progress Report**
	The bidder shall render such report as to the progress of work and in such form as may be called for by the Buyer from time to time. The submission and acceptance of such reports shall not prejudice the rights of the buyer in any manner. Bidder shall communicate to BHEL immediately, the change of address, ownership, contact person(s), the mobile numbers and e-mail of the dealing person concerned. Milestones shall be periodically updated by bidder through PRADAN Portal **(https://hpep.bhel.com/mm/).** Non updation will adversely affect service rating of bidder performance.
32	**Non-disclosure Obligations**
	Drawings, technical documents or other technical information received by one party shall not without the consent of the other party, be used for any other purpose than that for which they were provided. They may not, without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to third parties. All information and data contained in general product documentation, whether in electronic or any other form, are confidential and binding only to the extent that they are by reference expressly included in the contract. The bidder shall, as per agreed date/s but not later than the date of delivery, provide free of charge any information and/or drawings which are necessary to permit the Buyer to erect, commission, operate and maintain the product. Such information and drawings shall be supplied as specified in technical specification. All intellectual properties, including designs, drawings and product information etc. exchanged during the formation and execution of the contract shall continue to be the property of the submitting party. The bidder shall provide Buyer with all information pertaining to the delivery in so far as it could be of importance to Buyer. The bidder shall not reveal confidential information to its own employees not involved with the tender/contract and its execution and delivery or to third parties, unless Buyer has agreed to this in writing beforehand. The bidder shall not be entitled to use the Buyer's name in advertisements and other commercial publications including website without prior written permission from Buyer. In the event of violation of the confidentiality as agreed, BHEL will take legal action as deemed fit. Non-disclosure agreement to be entered as per **Annexure- II** wherever applicable.
33	**Inspection and Testing** (Refer Section 3.4 for details)

A	The goods and stores shall be manufactured by approved quality system and each part/component may be inspected and tested by the Buyer prior to shipment and shall comply with relevant requirements. Buyer has the right to inspect at any stage during manufacture/ delivery.
B	Buyer or his authorized representative shall be entitled at all reasonable times during execution to inspect, examine and test at the bidder's premises the material and workmanship of all stores to be supplied under the contract, and if the part of the stores are being manufactured at other premises, the bidder shall obtain for buyer or his authorized representative permission to inspect, examine and test as if the said stores are being manufactured at the bidder's premises. Such inspection, examination and testing, if made shall not release the bidder from any obligation under the contract. For indigenous bidders all costs related to first inspection request shall be borne by the buyer and the cost of subsequent inspections due to non-readiness of material/rework/ rejections shall be borne by the bidder. In case of imports all inspection charges including third party inspections if any shall be borne by the bidder. The cost of inspection staff/third party specified by the Buyer shall be borne by bidder unless otherwise specifically agreed. If the contract provides for tests on the premises of the bidder or any of his sub-contractor/s, bidder shall be responsible to provide such assistance, labor, materials, electricity, fuels, stores, apparatus, instruments as may be required and as may be reasonably demanded to carry out such tests efficiently. Cost of any type test or such other special tests shall be borne by the bidder unless otherwise specifically agreed in the contract. The Bidder shall give the authorized representative of the buyer reasonable notice in writing of the date on and the place at which any stores will be ready for inspection/ testing as provided in the Contract. Annexure – I, may strictly be complied with for the time lines. Any delay in submission of the documents by the bidder will not alter the delivery date.
34	**Quality and Condition of the Deliverables**
	The bidder shall be responsible for compliance with applicable technical, safety, quality, environmental requirements and other regulations in relation to products, packaging and raw and ancillary materials.
35	**Packaging and Dispatch**
	The bidder shall package the deliverables safely and carefully and pack them suitably in all respects considering the peculiarity of the material for normal safe transport by sea/air/rail/road to its destination suitably protected against loss, damage, corrosion in transit and the effect or tropical salt laden atmosphere. The packages shall be provided with fixtures/hooks and sling marks as may be required for easy and safe handling by mechanical means. Special packaging conditions/ environmental conditions as defined in the NIT shall be fully complied. Each package must be marked with consignee name, address, P.O. number, Package Number, gross weight & net weight, dimensions (Lx B x H) and bidder's name. The packing shall allow for easy removal and checking of goods on receipt and comply with carrier's conditions of packing or established trade practices. Packing list for goods inside each package with P.O. item No. & quantity must also be fixed securely outside the box to indicate the contents. If any consignment needs special handling instruction, the same shall be clearly marked with standard symbols/instructions. Hazardous material should be notified as such and their packing, transportation and other protection must conform to relevant regulations
36	**Contract variations; Increase or decrease in the scope of supply**
	Buyer may vary the contracted scope during execution due to exigencies of project requirement. If the bidder is of the opinion that the variation has an effect on the agreed price or delivery period, Buyer shall be informed of this immediately in writing along with technical details, and in the event of additional work, submit a quotation with regards to the price and period involved, as well as the effect this additional work will have on the other work to be performed by the bidder. Wherever unit rates are available in the contract, the same shall be applied to such additional work. The bidder shall not perform additional work before buyer has issued written instructions/amendment to the purchase order to that effect. The work which the bidder should have or could have anticipated in terms of delivering the service (s) and functionality (ies) as described in this agreement should be executed by the bidder without any price implication. In case of no change in the scope / technical specifications, bidder shall endeavor to keep the material ready and intimate the same to BHEL within the contractual delivery date, failing which, the delay if any will be attributed to supplier, and any upward price variation thereof for delivery at a later date is not admissible.
37	**Rejected/Short shipments/ warranty/guarantee replacements**
	In case of any short shipment during initial supply which is subsequently dispatched by the bidder or any guarantee / warranty replacements shall be dispatched on "DDP-Delivered duty paid BHEL stores" basis for imported items and "FOR-BHEL Stores/designated destination" basis for indigenous items.

38	**Export Administration Regulations**
	If a delivery includes such technology and / or supply that is subjected to the export regulations the bidder shall obtain due permissions, approvals, license etc.
39	**Force Majeure**
	The bidder shall not be considered in default if delay occurs due to causes beyond their control such as Acts of God, Natural calamities, Fire, Frost, Flood, Civil War, civil commotion, riot, Government Restrictions. Only those causes that have duration of more than seven days shall be considered cause of force majeure. Notification to this effect duly certified by local chamber of commerce/statutory authorities with supporting documents shall be given by the bidder to BHEL by registered letter/courier service immediately without loss of time. In the event of delay due to such causes the delivery schedule shall be extended for a length of time equal to the period of Force Majeure or at the option of BHEL the order may be cancelled. Such cancellation would be without any liability whatsoever on the part of BHEL. In the event of such cancellation the bidder shall refund any amount advanced or paid to the bidder by BHEL and deliver back any material issued to him by BHEL and release facilities, if any provided by BHEL.
40	**Non-waiver of Defaults**
	If any individual provision of the contract is invalid, the other provisions shall not be affected.
41	**Settlement of Disputes**
	Except as otherwise specifically provided in the contract, all disputes concerning questions of the facts arising under the contract, shall be decided by the Buyer, subject to written appeal by the bidder to the buyer, whose decision shall be final. Any disputes of differences shall to the extent possible be settled amicably between the parties thereto, failing which the disputed issues shall be settled through arbitration The bidder shall continue to perform the contract, pending settlement of disputes(s).
42	**Conciliation clause**
	CONCILIATION CLAUSE FOR CONDUCTING CONCILIATION PROCEEDINGS UNDER THE BHEL CONCILIATION SCHEME, 2018: The Parties agree that if at any time (whether before, during or after the arbitral or judicial proceedings), any Disputes (which term shall mean and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation, effect, interpretation or breach of the agreement, contract or the Memorandum of Understanding, penalty deduction, time extension), which the Parties are unable to settle mutually, arise inter-se the Parties, the same may, be referred by either party to Conciliation to be conducted through Independent Experts Committee to be appointed by competent authority of BHEL from the BHEL Panel of Conciliators. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in Procedure in http://www.bhel.com/index.php/story_details?story=2454 . The Procedure together with its Formats will be treated as if the same is part and parcel hereof and shall be as effectual as if set out herein in this ITB
43	**ARBITRATION (WITH SOLE ARBITRATOR)**
	Except as provided elsewhere in this Contract, in case amicable settlement is not reached between the Parties, in respect of any dispute or difference; arising out of the formation, breach, termination, penalty deduction, validity or execution of the Contract; time extension, or, the respective rights and liabilities of the Parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract, then, either Party may, by a notice in writing to the other Party refer such dispute or difference to the sole arbitration . Sole arbitrator to be appointed by Head of the Unit - BHEL , HPEP .
	The Arbitrator shall pass a reasoned award and the award of the Arbitrator shall be final and binding upon the Parties.
	Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause. The seat of arbitration shall be Sangareddy / Hyderabad, Telangana. The language of arbitration shall be English and the documents shall be submitted in English.
	The cost of arbitration shall initially be borne equally by the Parties subject to the final apportionment of the cost of the arbitration in the award of the Arbitrator.

	Subject to the arbitration in terms of clause 45, the courts at Sangareddy, Telangana State shall have exclusive jurisdiction over any matter arising out of or in connection with this contract. Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the Contractor shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and expedition in a professional manner except where the Contract has been terminated by either Party in terms of this Contract.
	ARBITRATION FOR CONTRACT WITH PUBLIC SECTOR ENTERPRISE (PSE) OR A GOVERNMENT DEPARTMENT
	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 0M No 4(1)/2013DPE(GM/FTS 1835 dated 22-05-2018
44	**Applicable Laws and jurisdiction of Courts**
	This agreement shall be construed and interpreted in accordance with the laws of India and shall have exclusive jurisdiction of Sangareddy/Hyderabad courts, Telangana, India.
45	**BHEL-Fraud prevention policy shall be adhered to.**
	The Bidder along with its associate/ Collaborators/ Sub-contractors/ sub-bidders/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention policy displayed on BHEL Website http://www.bhel.com and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice. List of nodal officers is hosted on BHEL Hyderabad website https://hpep.bhel.com/.
46	**Suspected Cartel Formation**
	The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies / guidelines.
47	**Conflict of Interest:** "A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if: a) they have controlling partner (s) in common; or b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or c) they have the same legal representative/agent for purposes of this bid; or d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ subassembly/ Assemblies from. one bidding manufacturer in more than one bid; or f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorize only one agent/dealer. There can be only one bid from the following: 1. The principal manufacturer directly or through one Indian agent on his behalf; and 2. Indian/foreign agent on behalf of only one principal; or g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; or h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business."

48	Definitions
Throughout these conditions and in the specifications, the following terms shall have the meanings assigned to them, unless the subject matter or the context requires otherwise.	
48A	'The Purchaser' means BHEL- Bharat Heavy Electricals Limited Hyderabad / Bhopal (A Govt. of India Undertaking) incorporated under the companies Act having its registered office at BHEL House, Siri fort, New Delhi-110049, India and shall be deemed to include its successors and assigns. It may also be referred to as BHEL.
48 B	'The seller' means the persons, firm, company or organization on whom the Purchase order is placed and shall be deemed to include the seller's successors, representatives, heirs, executors and administrator as the case may be. It may also be referred to as Bidder, Contractor, supplier or vendor.
48 C	'MOU' shall mean and include the Purchase order incorporating various documents viz., tender/offer, letter of intent/acceptance, the General Conditions of contract and special conditions of contract for Purchase, specifications, inspection/quality plan, schedule of prices and quantities, drawings, if any enclosed are to be provided by the Purchaser or his authorized nominee and the samples or patterns if any to be provided under the provision of the contract. In case of any inconsistency or contradiction between any of the documents, the order of precedence shall be MOU, Purchase Order, LOI/LOA followed by specific conditions, special conditions of contract and general conditions of contract for commercial conditions; and specific agreement on technical conditions, special technical conditions and general technical conditions, tender/ offer.
48D	'Parties to the contract' shall mean the seller and the purchaser as named in the main body of the Purchase Order.

ANNEXURE – 4

Suggested Major activity timelines			
S.NO	**Activity**	**Agency**	**Timeline**
1	PO acknowledgement	SUPPLIER	5 days from PO
2	Submission of drawings and QAP	SUPPLIER	21 days from PO
3	Approval of Drawings and QAP/FAT schedule	BHEL/M/S OIL	15 days from receipt
4	Raising of inspection call	Supplier	45 days before readiness of equipment
5	Inspection completion	Self/BHEL/Third party Inspection agency as mentioned in PO/contract	Within 15 days from readiness of equipment.
6	Dispatch instructions / Clearance	BHEL	10 days from inspection report

Note : Above time lines to be finalized with successful bidder.

Annexure – 5

Proforma for self-certification by Supplier for minimum local content on their letter head for tender value less than Rs 10 Crore

"We _____ (Name of Manufacturer) undertake that we meet the mandatory minimum Local Content (LC) requirement i.e. _____ (to be filled as notified in the policy) for claiming Purchase Preference linked with Local Contents under the Govt. policy against tender no. _____."

Sd/-
Authorised Signatory with Stamp

Auditor's certification with respect to minimum local content on the letter head of Statutory Auditor for tender value above Rs.10 crore

"We _____ the statutory auditor of M/s _____ (name of the bidder) hereby certify that M/s_____ (name of manufacturer) meet the mandatory Local Content requirements of the Goods and/or Services i.e. _____ (to be filled as notified in the policy) quoted vide offer No._____ dated _____ against BHEL's tender No._____ by M/s _____ (Name ofthe bidder)."

Annexure - 6

Proforma for self-certification by Supplier for Compliance to Clause No. 20 (B)

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and I certify that M/s.... (Name of firm) is **not from such a country/is from such a country (**delete whichever is NOT applicable**)** and has been duly registered with the Competent authority (delete if NOT applicable) . I hereby certify M/s ..... fulfills all requirements in this regard and is eligible to be considered . (where applicable , valid registration by the competent authority shall be attached)

Sd/-
Authorised Signatory with Stamp

SECTION – 3

TECHNICAL SPECIFICATION

CONTENTS

SECTION – 3.1

TECHNICAL SPECIFICATION OF 3000 HP ACVFD RIG

CONTENTS

3.1.1. 3000 HP AC DRAW WORKS

	BHEL REQUIREMENT	Bidders Remarks: (Confirmed/Not Confirmed/Deviation) Additionally, bidder to provide brief details including make, model, key specification parameters etc., of their offered equipment/items and additional remarks, if any. Relevant File Location in the Bid to support the remarks/compliance. (File Name & Page no. to be mentioned)
2.3	AC-E-3000DRAWWORKS:	
	• One (1) 3000 HPAC variable frequency drive (VFD) , single speed or two speed gear driven Draw-Works conforming to API 7K latest edition. The motor and frequency drive should be capable of holding full load at zero speed. • 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. • High capacity air and/or water cooled multiplate Disc brake unit to provide dynamic tensioning, static holding and emergency stopping (fail-safe braking system) coupled to Drum Shaft ends and secured to the Drum frame. • Mounted on heavy duty self-supporting steel structure (oil field skid) capable of holding all the loads of the Drawworks . The skid will be mounted on intermediate flooring/ platform between ground and rig floor pinned to the substructure. • The Draw-works flooring designed to have 3 meter (approx.. 9.85 ft) clear height from ground and shall move with the Rig during Rig walk. ** This is required to move the structure over well head during rig walk. • Force lubrication system for bearings and Force/ splash lubrication for all the gears . The system will include but not limited to pump unit , Oil filter , heat exchanger ,gauges & other monitoring equipment . The lubrication system should have	

	suitable redundancy. □ Gear Box–One or two no. of reduction gear box as designed for the rated power & performances of draw-works. □ Air Intensifier – An Air intensifier system at suitable position to ensure that the recommended pressure & flow rate of Air is maintained to Draw-works □ Draw-works control system software should include following equipment monitoring system : I. Monitoring & control of brake & lube oil system. II. Dynamic floor & crown saver III. Slip & cut function Note :Bidder to refer SECTION 12 Transport dimension & WEIGHT Limitation of the draw works . In case the Drawworks dimension & weigh is beyond the transport limiting value the OEM should design the Draw-works to split in two components in such a way that the assembly/ disassembly for road transportation shall be easy and will not affect the performance of the components) . The Bidder need to submit details of Draw-works in split scenario with diagram in bid submission. The successful bidder needs to get approval o the design before releasing order . Note: Following spares to be supplied with the rig. 1. Operational spare for lubrication system including pump 2. Disc brake repair kit (Bidder to refer SECTION 3.5 Transport dimension & WEIGHT Limitation o the draw works so that draw works can be transported as a single unit with dis brake)		
	Note: Quantity as per Section-3.8A (Mandatory Spares)		
	Draw works Specification & Feature:		
2.3.1	Rated Horsepower	3000 HP continuous	
2.3.2	Drive motors	DWS VFD Motors: Suitable For 3000HP Draw works (Qty 2/3) AC VFD motors shall be suitable for use in hazardous areas of drilling rigs. For details refer to section 3.1.8 (Electrical systems).	
2.3.3	No. of Drums	One	
2.3.4	Drum size	36 inch x 80 inch (slight variation in dimension is acceptable)	
2.3.5	Grooving	Lebus Type grooved for 1 ¾" or 1 5/8" wire line	
2.3.6	Hoisting Capacity (min)	680 MT or 1,500,000 lbs with 14 lines in 3rd layer	

2.3.7	Transmission	Transmission :: Direct gear drive. The double reduction helical gear box. A single unit of gear box assembly or two unit of gear box at both ends of drum shaft as designed for rated power & performances.	
2.3.8	Auxiliary brake	Friction type, multi-plate, air/ water cooled Disc Brake for dynamic tensioning, holding & emergency stop. Control shall be from Drillers cabin Draw-works control.	
2.3.9	Main brake	Dynamic Braking System with VFD motors.	
2.3.10	Crown & floor saver	Crown & Floor Electronic systems saver system with proximity sensor integrated with drilling control software. In addition to above toggle valve located above the drum of Draw-works for preventing	
2.3.11	Lube system	DELETED	
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.	

Note: "Remote I/O boxes which are part of remote equipment such as AC Drawworks, AC Mud pumps, AC Top Drive, Rig Instrumentations etc and requires cable interconnections during rig move should be provided with quick connect plug & receptacles in I/O boxes for fiber optic/communication cables and other control cables."

3.1.2. 750Ton AC TOP DRIVE

	BHEL REQUIREMENT	Bidders Remarks: (Confirmed/Not Confirmed/Deviation) Additionally, bidder to provide brief details including make, model, key specification parameters etc., of their offered equipment/items and additional remarks, if any.
2	750 Ton AC Top Drive System(TDS): One (1) No.	
2.1	750 Tons (680 MT or 1,500,000 lbs) capacity Top Drive System (TDS) driven by Variable Frequency Drive (VFD) control system suitable for wide range of torque	
2.1.A	750 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 (operated from TDS control system in Drillers	
2.1.A.5	Counter balance /weight compensating system to provide cushion between saver sub & drill pipe during making / braking connection .	
2.1.A.6	Top Drive Control integrated into the Drilling control system in Drillers console	

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	DELETED		
2.1.A.12	Integration of latest software with drilling control system for TDS controlling , monitoring & prevention of collision .		
2.1.A.13	DELETED		
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):On board / off-board . In case of off-board standalone HPU need to provide.		
2.1.B	750 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 3.1.8.		
2.1.B.2	Torque and Speed		
	Continuous Torque	62,000 - 65,000 ft.-lbs (minimum) at @ 90 RPM	
	Torque at Max. Speed	20,000 ft. lbs (minimum)	
	Maximum Speed	250 – 270 RPM	
	Break out torque Make-up torque	100,000 ft. lbs – 110,000 ft-lbs 90,000 ft-lbs – 95,000 ft-lbs	
	Tubular Range	2-3/8" – 6 5/8" nominal pipe diameter	
2.1.B.3	Hoisting	750 Tons.	
2.1.B.4	Water Course	4" or as per OEM design	
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 5" 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 3.1.8 (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. For details refer to section 3.1.4 & 3.1.5 (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. All in-line joints/ connections provided on the top drive cables shall be of Explosion-proof 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 /750 Ton Elevator Links	
2.1.4	S-PIPE PACKAGE:	
2.1.4.1	Package should include a 7500-psi capable S-Pipe preferably with approximately 20- degree elbow. The connection for the Rotary Hose shall be a female, 5-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).	
2.1.4.2	The Elbow shall have an upper connection to the S-Pipe that is a 5-inch Fig 1002 Union with the Female half being on the S-Pipe. The Elbow can be removed to have a 5 inch Female Fig 1002 Union pointing straight down for connection of the Rotary Hose directly	

2.1.5	**CASING RUNNING TOOL (CRT):** Sets of Casing Running Tool with required components for lowering casing of sizes 4-½" to 20" by connecting to the Top Drive System main shaft. The casing running tool (CST) should capable of simultaneous reciprocation , rotation and circulation apart from make up and break-out of casing joints through TDS power. The system should combine with torque/turn monitoring and data storing device . # Weight compensator . # Operating from Drillers control room		
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 – Not required)		
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 either from standalone Hydraulic unit or Rig central Hydraulic unit		
SPECIFICATION:			
2.1.5.11	Hoist Rating (API 8C)	750 Ton	
2.1.5.12	Casing Size	4-½ inch to 20 inch	
2.1.5.13	Fill Up and Circulation	4-½ inch to 20 inch	
2.1.5.14	Maximum Circulation Pressure	5000 psi	
2.1.5.15	Rotational Speed	Upper limit 100 RPM or more	
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	60,000 to 65,000 ft-lbs.	

~~2.1.5.18~~	~~Compensator Capacity @ 90 psi air supply~~	DELETED	
2.1.5.19	Link Tilt out distance	Minimum 14 ft	
2.1.5.20	Shaft Connection	NC50 (4-½" IF) API RH Box for connection with TDS Saver Sub. Note: TDS Saver sub bottom connection NC 50 (4 ½" IF) API Right Hand Pin.	
2.1.6	BAIL PACKAGE:		
2.1.6.1	Package should include an API 750 Ton 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 required for maintenance and repair shall be supplied with the TDS including accumulator charging tool kit , Lower IBOP Hex wrench and IBOP valve seat replacement tool.		
2.1.8.2	DELETED		
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 & 750 TON ELEVATOR LINK:		
2.1.9.1	Set of U-Bolts for accommodating 350 Ton and 750 Ton capacity Elevator Links		
2.1.9.2	Clamp for accommodating 350 Ton and 750 Ton capacity Elevator Links		
2.1.10	WELDLESS LINKS (API MONOGRAMMED: API SPEC 8C):		
2.1.10.1	One (1) pair of 350 Ton Capacity Weld less Links, 2-3/4" x 168" (70 mm x 4267 mm)		
2.1.10.2	One(1) pair of 750Ton Capacity Weldless Links, 4-3/4" x168"(120.6mmx4267mm)		

2.1.10.3	One (1) pair of 350 Ton Capacity Weld less Links, 2-3/4" x 132" (70 mm x 3352.8 mm)	
2.1.10.4	One(1) pair of 750Ton Capacity Weldless Links, 4-3/4"x168" (120.6mmx4267mm)	
2.1.11	MANDATORY SPARES:	
2.1.11.1	i) Wash pipe assembly with Repair kit as per OEM ii) TDS saver sub(NC50) iii) Hydraulic oil filter iv) Gear oil filter v) Upper & Lower IBOP assembly with repair kit. Note: Quantity as per Section-14 (Mandatory Spares) Note: Quantity as per Section-3.8 (Mandatory Spares)	

Note:

1) **"Remote I/O boxes which are part of remote equipment such as AC Drawworks, AC Mud pumps, AC Top Drive, Rig Instrumentations etc and requires cable interconnections during rig move should be provided with quick connect plug & receptacles in I/O boxes for fiber optic/communication cables and other control cables."**
2) **All the cables and connectors (Power, control and communication) for connectivity of the Top drive unit with TDS house and/or Rig power system shall be in the scope of Bidder. The length of the cables shall be sufficient to enable 3+1 cluster well on a straight line/ diagonally or 100 m of length, whichever is higher.**
3) **Connectors and other accessories as required for cable termination at the Grass hopper junction box shall be in bidder scope.**

3.1.3. AC MUD PUMP

Mud Pumps - 1600HP: 3 No's

	BHEL REQUIREMENT	Bidders Remarks: (Confirmed/Not Confirmed/Deviation) Additionally, bidder to provide brief details including make, model, key specification parameters etc., of their offered equipment/items and additional remarks, if any. Relevant File Location in the Bid to support the

4.1	MUD PUMPS – 1600 HP: As per Section 3.8 (Mandatory Spares) 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, 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 shall be driven by suitably rated electric motor completed 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). Mud Pump Motor: VFD AC MOTOR Quantity & capacity as per OEM design and suitable for above mud pump. AC VFD motors shall be suitable for use in hazardous areas of drilling rigs. For details refer to section 3.1.8.		
4.1.2	Mud Pump Capacity:		
4.1.2.1	Rated max. input HP	Rated max. input HP	
4.1.2.2	Stroke Length	12 inch (Min.)	
4.1.2.3	Individual pump Discharge (approx.)	Discharge at rated SPM with replaceable liners and pistons - Min. 2914 litres/min (770 US GPM) at 225 kg/cm 2	
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/		
4.1.3.5	Provision for manual rotation of the crankshaft externally for maintenance		

4.1.3.6	Modules should be individual, 2 (two) piece, 'L" shaped, separate, forged alloy steel (AISI 8630 / 4130 /equivalent), 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 (Manual/Hydraulically operated).	
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 3.1.8	
4.1.3.11	Pump fitted with liners (API 7K) held rigidly in place with a 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	
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 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	DELETED	
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). 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 motors, pump drive and their accessories are to be submitted along with the offer.	

4.1.3.18	DELETED	
4.1.3.19	One Complete Valve Seat Puller Assembly Suitable for above mentioned Valve Seat and One Set Of Special OEM recommended Hand Tools For Fluid End Maintenance (i.e. Valve Pot Tool, Wrench For Valve Cover, For Studs On The Hydraulic Cylinders, Liner Bushing Puller Plate, 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	DELETED	
4.1.3.22	DELETED	
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 for assembly/ disassembly of Piston assembly & Valve assembly.	
4.1.3.25	Each mud pump package should be assembled with the following	
4.1.3.26	One (1) Discharge Strainer Cross Assembly complete with suitable strainer (Left side when viewed from Fluid end).	
4.1.3.27	5''-7500 psi (527.2 Kg/sq. cm) Max. WP Discharge flange RJ connection with weld neck welded to integral forced steel elbow (MW.P. 7500 psi) of	
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 1502 wing union and isolating valve (make OTECO/DEMCO or equivalent)	
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 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. The flange will be with one (1) extra 2" opening with high pressure plug to connect Drillometer.	
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 1502 wing union having compatible line & fittings.	
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, 4 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 1502 wing union on either ends	
4.1.3.34	One (1) Discharge Pulsation Dampener (Make - Mattco or equivalent), maximum service pressure 7500 PSI (527.2 Kg/sq. cm), surge capacity 75 Litres (20 gallons). Connections - 4" (100 mm) API BX-155 RTJ, Diaphragm – Hydrogenated Nitrile or equivalent.	
4.1.3.35	One (1) Pressure gauge on each pump (Make- OTECO/CAMERON or equivalent), 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 or equivalent)	

4.1.3.36	One (1) Manual reset relief valve, 3" (75 mm) manual reset 1500 – 8000 PSI WP (Make- OTECO/NOV or equivalent).	
4.1.3.37	Suitable external gear pump for circulating lube oil, if any	
4.1.3.38	External closed circuit liner flushing mechanism	
4.1.3.39	One (1) Charging system with charging hose assy. for pulsation dampener	
4.1.3.40	One (1) Jib crane with trolley installed on each pump to handle fluid end	
4.1.3.41	One (1) Hand Hoist of Proven Make, 1/2 Ton Lh 8 Ft Lift For Use With Jib Crane	
4.1.3.42	Emergency Stop Switch with locking & Indication system on Mud pump	
4.1.3.43	Light fittings shall be Ex. Certified for use in hazardous areas of drilling rigs. Refer to section 3.1.4 for details of lighting specifications.	
4.1.3.44	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.	
4.1.3.45	Double earthing system of main motors and all auxiliary motors with suitable size of GI strip earthing with MP skid. Refer to section 3.1.8 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 the rig for the mud pumps.	
4.1.5	INSPECTIONS OF MUD PUMPS:	
4.1.5.1	Bidder shall agree to load test/factory acceptance test and pre-dispatch inspection of the mud pumps, by OIL personnel, at manufacturer's facility before dispatch. The Inspection cum Acceptance process would include the following minimum steps/tasks (valid for that stage of manufacture / integration)	
4.1.5.2	Physical verification/inspection of all the items/fittings/accessories.	
4.1.5.3	Operational / functionality testing of each & every system/component under load (if applicable) / no load. Performance parameters shall match quoted specifications.	
4.1.5.4	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.	
4.1.5.5	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.	

4.1.5.6	Supplier to inform 60 days in advance for inspection of the mud pumps				
4.1.5.7	Supplier will affect dispatch of the units only on receipt of OIL's dispatch				
4.1.5.8	OIL reserves the right to inspect the manufacturing process of the mud pumps for verifying actual project progress as well as technical specification compliance.				
4.1.5.9	In case of award of order, bidder to submit Quality Assurance Plan to facilitate OIL to inspect the manufacturing process of the mud pumps. The Quality Assurance Plan is to be in line with API specifications.				
4.1.5.10	Notwithstanding anything written in this tender document, the mud pumps have to be manufactured/assembled in a facility with API certification in the name of the OEM of the Mud Pumps. The API certificate should be valid at the date of bid closing.				
4.1.5.11	THE INSPECTION STRATEGY SHALL BE AS FOLLOWS				
4.1.5.12	Activity >	Intermediate Inspection of manufacturing process, before FAT, at manufacturer's works	Load Test & FAT	Complete, integrated rig package, at suitable location,	
	Mud Pumps	OIL reserves the right to inspect the manufacturing process for verifying actual project progress.	√	√	
4.1.5.13	However, such inspections shall not relieve the supplier of their responsibility to ensure that the equipment supplied is free from all manufacturing and other defects and conforms to correct specifications.				
4.2	PUMP DRIVE AND MOTOR SKID:				
4.2.1	DELETED				
4.2.2	DELETED				
4.3	PUMP DRIVE MOTOR [For details, refer Section 3.1.8]				
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 3.1.8 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 MANDATORYSPARES: Note: Quantity as per Section 3.8				
	Mud Pump mandatory spares Per Rig (Consumables). The following mandatory spares shall be included in the scope of supply				
4.5.1	Deleted				
4.5.2	Deleted				
4.5.3	Liner (any one size) 7" /7¼"/7½"	Note: Quantity as per Section			

4.5.4	Liner (any one size) 6"/6¼"/6½"	3.8 (Mandatory spares)	
4.5.5	Deleted		
4.5.6	Deleted		
4.5.7	Piston Assembly (any one 7" /7¼"/7½"size)		
4.5.8	Piston Assembly (any one size) 6"/6¼"/6½"		
4.5.9	Piston Rod complete		
4.5.10	Valve Seat		
4.5.11	Valve assembly with polyurethane insert		
4.5.12	Valve insert (polyurethane)		
4.5.13	Valve spring		
4.5.14	Valve cover gasket		
4.5.15	Deleted		
4.5.16	Deleted		
4.5.17	Liner gasket, (any one size) 7"/7¼" /7½ "		
4.5.18	Liner gasket, (any one size) 6"/6¼ "/6½"		
4.5.19	Wear plate gasket		
4.5.20	Wear plate		
4.5.21	DELETED		
4.5.22	Banded power belt, if applicable		
4.5.23	Pulsation Damper repair Kit		
4.5.24	Valve seat puller (with pump) set		
4.5.25	Lube Oil Pump Assembly		
4.5.26	Flushing Pump Assembly		
4.5.27	Lube oil Filters		
4.5.28	Ring Gasket for Suction, Discharge Manifold and Pulsation Dampener		
4.5.29	Stroke counter meter/Stroke counter sensor (whichever is applicable)		
4.5.30	Belt tension meter (analogue), (if applicable)		
4.5.31	3'' RRV ,(1500 psi – 7500 psi), Manual reset		
4.5.32	Special Tools for fluid end & pulsation dampener maintenance		
4.5.33	DELETED		
4.5.34	Pulsation Dampener (rating 7500 psi) of Make-Mattco or equivalent suitable for the offered pumps		
4.5.35	Cross Piece (7500 psi rating)		
4.5.36	Infrared thermometer		
4.5.37	DELETED		
4.5.38	DELETED		
4.5.39	Piston Rubber (any one size) 7" /7¼" /7½"		
4.5.40	Piston Rubber (any one size) 6"/6 ¼ "/6½"		

4.5.41	Liner Bushing Puller and Wear Plate Puller (if applicable) Notes: Sizes of Liners and Pistons should be same		
4.5.42	Charging Hose assembly (with fittings) for Nitrogen pre-charging in Pulsation dampener		
4.5.43	Valve Cover		
4.5.44	0-10000 PSI Pr. gauge, type F, Connection: 2” Female Threaded or 2" Hammer Union		
4.5.45	3" gate valve, Max WP 7500 Psi,		
4.5.46	Repairing Kit, 3” gate valve, Max WP 7500 Psi		
4.5.47	Butterfly valve of each size used (12” / 10’’ /8” / 6”/ 4” / 2” etc.)		
4.5.48	Vibrator hose, API Grade-E, 4 inch ID		
4.5.49	Liner Spray System		
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 evidence 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 evidence 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	DELETED		
4.6.10	Whether auxiliary motors are flame proof and suitable for use in hazardous		
4.6.11	Whether detail specifications of Pump along with technical literature / catalogue		
4.6.12	Whether spare parts for the offered pump will be available for next 15 years		
4.6.13	Whether 3 sets of part list with part numbers, quantity and unit rate recommended for four years of operation are		
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		

Note: "Remote I/O boxes which are part of remote equipment such as AC Drawworks, AC Mud pumps, AC Top Drive, Rig Instrumentations etc and requires cable interconnections during rig move should be provided with quick connect plug & receptacles in I/O boxes for fiber optic/communication cables and other control cables."
****Bidder to confirm?**

3.1.4. VFD HOUSE FOR 3000 HP RIGS

	BHEL REQUIREMENT	Bidders Remarks: (Confirmed/Not Confirmed/Deviation) Additionally, bidder to provide brief details including make, model, key specification parameters etc., of their offered equipment/items and additional remarks, if any. Relevant File
9.5	POWER CONTROL ROOMS (PCR) Power control room (s) shall house the main Variable Frequency Drive panels, Control panels for VFD, auxiliary motor panels (MCC), Generator control panels, Dynamic brake control panels, PLC/SBC/PAC panel, NGR panel, Transformer feeder breakers etc.	
9.5.1	The PCR design strategy shall be as following:	
9.5.1.1	PCR-1 shall contain (indicative only):	
9.5.1.1.1	control panels, Synchronization system	
9.5.1.1.2	Diode Rectifier and VFD (inverter) panels	
9.5.1.1.3	MCC for auxiliary motor starters/ feeders	
9.5.1.1.4	Dynamic brake controller/ chopper. 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 contain (indicative only):	
9.5.1.2.1	Diode Rectifier and VFD (inverter) panels	
9.5.1.2.2	MCC for auxiliary motor starters/ feeders	
9.5.1.2.3	Soft-starter panel for auxiliary motors of 75HP or more	
9.5.1.2.4	NGR Panel	
9.5.1.2.5	Main transformers (600V/415V), 2 nos. lighting transformers (415V/230V Delta-Yn) and 1 no. isolation transformer (415V/415V Delta-Yn)	
9.5.1.2.6	Day light Aviation (white flasher type) warning light control panel (if applicable)	
9.5.1.2.7	Plug socket compartments for interconnection with various main and auxiliary loads	
9.5.1.2.8	Any other electrical system necessary for operation of the rig electrical equipment	

9.5.1.3	PCR-3 (optional) shall contain (indicative only):	
9.5.1.3.1	Diode Rectifier and VFD (inverter) panels	
9.5.1.3.2	MCC for all other auxiliary motor starters/ feeders	
9.5.1.3.3	Plug socket compartments for interconnection with various main and auxiliary loads	
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 (if required).	
9.5.1.4.3	Note-3: HMI panel of PLC/SBC/PAC shall be present in all the PCRs for monitoring.	
9.5.1.4.4	Actual number of PCR shall be as per OEM design requirement subjected to dimensional and weight limitations as mentioned section 3.5	
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 3.5 Limiting Weight: Refer section 3.5	
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	Oil Field 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 trailers 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 20cm. Sufficient provision should be available at both ends for lifting the entire PCR (bottom lift arrangement). The skid shall be properly prepared, and preferably painted with black coal tar epoxy paint with a final thickness of about 200 microns. However, PCR skid painting may be similar with paint specification and color as the body of the PCR (as mentioned in clause 9.5.2.2.12) or as per OEM's own standard design.	
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 as per OEM's standard design or with a sandwich style insulating board three eights 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	SOCKET BOARD/DISTRIBUTION COMPARTMENT: SOCKET BOARD panel for the Generator and Drilling motor cables to be provided on the front-end (facing the DWS). In case it is difficult to provide generator SOCKET BOARD panel on front end, then standard arrangement of the supplier i.e. generator SOCKET BOARD panel (recessed type) on the side facing power packs can be provided but height of such SOCKET BOARD panel should be around 1.5 mtrs from the ground level. The SOCKET BOARD 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 SOCKET BOARD panels due to rain. Interior & exterior sides of plug socket compartment on the PCRs shall be adequately illuminated using LED light fixtures.	
9.5.2.2.6	Indoor Lighting: LED lamps shall be used for aisle lighting of each PCR. Four (04) nos. 230-volt Phase–Neutral combination switch socket (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 (shall be provided by OIL during fabrication of PCR), 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:	
9.5.3.1	RIG CONTROL SYSTEM (Electrical part inside PCR): 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 Rig control system shall connect via the network to touch screen HMIs and/or to workstation hardware (such as joysticks, brakes, control switches, speed pots etc.) & VFD panels, field sensors, MCC panels etc. to provide control and monitoring of rig floor equipment.	
9.5.3.1.3	The Rig control system design shall avoid single point failures through a robust network with redundant touch screen HMIs running in parallel.	
9.5.3.1.4	Preferably, the rig may be provided with a 100% redundant /standby control system (with redundant CPU/Controller). Alternately, the OEM may provide their own scheme of redundancy /standby for the supplied control system.	

9.5.3.1.5	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.	
9.5.3.1.6	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.	
9.5.3.1.7	Each PCR shall be equipped with touch screen HMIs for monitoring purpose. HMI in PCRs shall display similar parameters as the one in the driller's workstation with only read mode (There shall not be any option to operate the drives from	
9.5.3.1.8	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.	
9.5.3.1.9	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):	
9.5.3.1.9.1	Miscellaneous indicators (Indicative only)	
	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	
9.5.3.1.9.2	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	
9.5.3.1.9.3	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	
	Charging Pump 3 ON	
	MP motors current (Amps), Voltage, speed, Torque etc.	
	Fault/ alarm	
	Mud pumps parameters (SPM, Total strokes, running hours, PSI etc.)	
9.5.3.1.9.4	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.)	
9.5.3.1.9.5	Top drive Indicators	
	Blowers ON	
	Lube pump ON	
	Fault/ alarm	
	Top drive parameters (KW, Amps, Torque, rpm, throttle signal etc.)	
9.5.3.1.9 .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 should be suitable for operating, controlling & protecting the Engine-alternator sets. The generator control system should be suitable for individual running or paralleling & load sharing with other power packs. There should be one Generator control panel per alternator.	
9.5.3.2.1	SALIENT FEATURES OF GENERATOR CONTROL PANELS: The Generator control system shall be suitable driving Rig Alternators as specified in section 3.1.8 and shall be driven by Engines	
	GENERATOR CONTROL PANELS ARE TO BE FITTED WITH (Indicative):	
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/equivalent) 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	
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. Alternatively, indications may also be displayed on the electronic generator control screen in lieu of individual LED lamps.	
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 circuit	
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. However, alternate	
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 kWAnalog/ Digital type	
9.5.3.2.2.4	Alternator Kilo-var meter, (-)150-0-1500 kVARAnalog/ 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 Hour's 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	RIG ALTERNATOR SYNCHRONIZING SYSTEM	
9.5.3.2.3.1	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.	
9.5.3.2.3.2	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. Alternatively, bidder may offer their own scheme for Auto/Manual Synchronisation.	
9.5.3.2.3.3	Other components of Synchronization system (Bus Voltmeter/ Frequency meter/Synch. Switch) shall be placed in one of the generator panel front fascia or independently. Alternatively, bidder may offer their own scheme for Auto/Manual Synchronisation.	
9.5.3.2.4	GROUND FAULT DETECTION CIRCUIT (in the 600 VAC & 415VAC Circuit):	
9.5.3.2.4.1	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) c) 415 VAC (AC auxiliary bus)- with NGR system Alternatively, bidder may offer their own scheme for Ground Fault detection.	
9.5.3.2.4.2	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. Alternatively, bidder may offer their own scheme for alarm and indication with regard to Ground Fault detection.	
9.5.3.2.5	POWER LIMIT CONTROL FEAUTRE:	
9.5.3.2.5.1	The Power Limit Control shall be incorporated to monitor the KW (i.e. actual loading of engines) and/or '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 (i.e. main drilling motors) until load demand is reduced to a level below the set power limit to prevent blackout. Alternatively, OEM may offer their own scheme for Power Limit	
9.5.3.2.5.2	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.	
9.5.3.2.5.3	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 shall be displayed on the Driller's Console when power limit is being approached/reached.	
9.5.3.2.6	HANDS-OFF CIRCUIT (HOC) (Indicative):	
9.5.3.2.6.1	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.	
9.5.3.2.6.2	The items to be included shall be as follows: a) Batteries & Charging system/ or UPS system b) Fuses/MCBs c) any other Control components Alternatively, bidder may offer their own scheme for starting of powerpacks.	
9.5.3.2.7	ENGINE GOVERNOR CONTROL (Indicative): Engine governor system should be as specified below:	
9.5.3.2.7.1	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^{o}C to +55^{o}C 4. No load to full load regulation of $\pm$1%	
9.5.3.2.7.2	Speed feedback/MPU Signal Range: As per OEM Design	
9.5.3.2.7.3	Engine throttle/actuator signal range: As per OEM Design	
9.5.3.2.7.4	Suitable kW load sharing scheme should be implemented. Bidder to indicate scheme / type of load sharing employed.	
9.5.3.2.8	ALTERNATOR VOLTAGE REGULATOR:	
9.5.3.2.8.1	Voltage Regulator for brushless excitation system (the latest technology available)	
9.5.3.2.8.2	The voltage regulation is to be limited to 3% droop (Max.)	
9.5.3.2.8.3	Suitable KVAR load sharing scheme should be implemented. Bidder to indicate scheme / type of load sharing employed.	
9.5.3.2.9	ENGINE/GENERATOR PROTECTION FEATURES: The alternator protection features shall include: a) Overcurrent	
	b) Overvoltage c) Over frequency d) Under frequency e) Reverse Power The protection for engines should be inclusive of but not limited to the above-mentioned features.	
9.5.3.3	CONVERTER/ RECTIFIER PANELS (Indicative): Suitably rated Two (02) or more rectifier panels should be provided in each PCR (strategically distributed) for supplying the VFD line-up in that PCR. Alternatively, bidder may provide DC Bus bar interconnection/ DC link switch between two PCRs as a provision for powering up VFD panels of any PCR from the rectifier panels placed in the other PCR. Rectifier panel shall include the following:	
9.5.3.3.1	Suitably rated withdrawable 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 & Voltmeter or any other suitable provision to monitor V & I	
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	
NOTE	***Advanced Diesel Engine Management, ECM with electronically controlled unit injectors, controlled by electronic /PLC 24V DC Battery along with individual charging system shall be part of CAT Engine supplier. Caterpillar SEMS & IVR (integrated voltage regulator) will take care of engine & alternator control and shall be part of CAT engine supplier.*** ***However necessary interfacing with Caterpillar Smart Engine Management System (SEMS) along with Integrated Voltage Regulator shall be in scope of VFD house manufacturer.***	
9.5.3.4	VFD/ INVERTER PANELS (Indicative):	
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 Draw Works	
9.5.3.4.1.2	Three mud pumps (ref. to section 3.1.3)	
9.5.3.4.1.3	One Independent rotary drive	
9.5.3.4.1.4	One Top Drive unit	
9.5.3.4.2	Each VFD inverter panel shall consist of the following main equipment (Indicative):	
9.5.3.4.2.1	Suitably rated DC MCCB/ACB/Isolator	
9.5.3.4.2.2	DC Pre-charge Circuit	
9.5.3.4.2.3	Voltmeter /Ammeter/ any other alternate provision for monitoring electrical	
9.5.3.4.2.4	LED indication lamp indicating: System charged; fault etc.	
9.5.3.4.2.5	Parallel connected 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/stop button	
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 PCRs 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/PCRs 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, draw works drives, IRD etc. fail during running, there shall be alarm of the same in Touch screen HMI at Driller's Cabin. Additionally, alarm shall be raised at PCRs 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(Indicative): 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(Indicative) 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	MAIN TRANSFORMER FEEDER PANEL: A feeder panel shall be provided to house suitably rated ACB/MCCB for power supply to Main transformer(s). Suitably rated, 600 Volts, 3-Pole, manually operated, Air Circuit Breakers/MCCBs for 600V/415V, Delta/Star, Dry Type Power Transformer(s) for powering auxiliary AC loads.	
9.5.3.8	600VAC FEEDER BREAKERS – Quantity (02) two nos. Two nos. of 600 VAC ACBs for supplying power to external drives from main bus shall be provided at a convenient location in the PCR. a. One (01) no. for Top drive house (if TDS Power control room is designed as separate house)	

	b. One (01) no. for 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: Suitably rated ACB rated (minimum 1200 Amps), 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.	
9.5.3.8.2	Feeder Breaker (Spare): Suitably rated ACB rated (minimum 2000 Amps), 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 shall be provided for future use.	
9.5.3.9	NGR SYSTEM FOR 3PH 415VAC SYSTEM: Neutral point of Main transformers (600V/415V) shall be grounded using neutral grounding resistors (NGR) with maximum ground fault current limited to 750 mA as per CEA-Regulations. The NGR system shall have the following features:	
9.5.3.9.1	Earth fault current shall be restricted at 750 mA using suitable resistors. The neutral shall not be served and supply from the main MCC bus shall be 3 Phase & 3 Wire (i.e., single phase 230V Ph-N loads shall not be connected to 415VAC 3PH AC BUSBAR with NGR system).	
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	MOTOR CONTROL CENTRE/ MOTOR STARTER PANELS: Motor control centre or MCC shall be mainly fed from the 415 AC bus in PCRs fed from the secondary of the main transformer(s) (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. However, MCC for few motors shall be fed from 415VAC Emergency Bus bar section. 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. 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/Driller's cabin (both manual & auto)	
9.5.3.10.1.8	Each motor starter 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 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.	
9.5.3.10.1.10	All the starters for AC motors (except Shale Shaker, Mud Cleaner, BOP Control unit, 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.	
9.5.3.10.1.11	415V Emergency Bus: (Refer to Annexure-AA-IX, Typical Single Line Diagram) The power from the 500 KVA Genset shall be fed into an emergency 415VAC bus bar section inside the PCR. To limit the load on 500 KVA Gen set, only following outgoing feeder /Motor Starter panel shall be from the 415VAC 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) if applicable e) Hazardous area lighting (i.e., incomer of 415V:230 Ph-Ph lighting transformer) f) Few Mud tank agitators (Four reserve tanks and one suction tank) g) Cellar pump h) One feeder for Supercharger pump i) Fuel decanting Pumps j) BOP CONTROL UNIT Note: However, the actual loads on 500kVA Aux. Genset shall be finalised during detailed Engineering stage. There shall be provision for electrical isolation of the emergency bus bar from the Main 415VAC bus bar section using a withdrawable type air circuit breaker (ACB/MCB) 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 500 KVA (minimum) Aux. Genset outgoing ACB/MCB and the emergency busbar isolation ACB/MCB, such that only one of the two operates at a time.	

9.5.3.10.1.12	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 (i.e. the emergency bus being fed from Main 600V/415V transformers), 500 KVA Aux. Genset outgoing ACB must open automatically. However, when Rig Powerpacks are not in operation, the emergency bus bar shall be fed from the 500 KVA Aux. Genset with the 500 KVA generator outgoing ACB closed and emergency bus bar isolation ACB	
9.5.3.10.2	Protections in starter and feeder panels: 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 (200 mA to 400 mA, selectable type)	
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 suitable time Delayed-Overload protection (adjustable), Short circuit protection and RCD with trip setting 200 mA to 400 mA, selectable type. 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.	
9.5.3.10.3.1	Remote PBS (Push Button Station) shall have “Hand-Off-Auto” features as required	
9.5.3.10.3.2	Remote 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, 2023, Regulation no.112(3) & 112(4)).	
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 consider 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	The air conditioners shall be able to reduce the relative humidity level to recommended levels from 98% by itself or additionally dehumidifier units may be provided if required.	
9.5.3.11.5	The AC system should have redundancy with at least one unit standby at any 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 1.0 KV (minimum) grade fire retardant PVC insulated tinned copper multi-stranded flexible cables with proper lugs.	
9.5.3.14	PCR EARTHING: PCR shall be provided with earth points for body earthing of the PCR enclosure, various panels via earth bus. Moreover, for Main transformers (600V/415V), NGR grounding with maximum ground fault current limited to 750 mA using suitable grounding resistor as per CEA Regulations is to be used.	
9.5.3.15	SOCKET BOARD/DISTRIBUTION COMPARTMENT: 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. socket boards/distribution 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 flexible copper cables of respective sizes.	
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 or any other suitable arrangement 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:	
	There shall be five power transformers in all inside Power Control Rooms: a. Two Main Transformers: 600V/415V (of suitable kVA capacity, minimum 600 kVA each) for MCC supply b. Two Lighting transformers: 415V/230V Ph-Ph (of suitable kVA capacity) for hazardous area lighting and other 230V Ph-Ph requirement c. One isolation transformer (internal): 415V/415V (of suitable kVA capacity, minimum 30kVA) for general lighting inside PCRs, Engine house, Compressor house & 230V Ph-N supply inside PCR, Powerpacks etc. All the transformers shall be protected through suitably rated ACBs/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 "Annexure-PCR Starters/Feeders" as per following broad specification:	
9.5.3.16.1.1	Capacity – As per OEM design requirement (600 kVA minimum)	
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 phases	
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 (230 VAC Phase-to-Phase) as per the following broad specifications: (CEA (Measures relating to safety and electric supply) Regulations, 2023, Regulation no.104)	
9.5.3.16.2.1	Capacity – As per OEM design requirement	
9.5.3.16.2.2	Voltage – 415/230 volts (Phase-to-Phase)	
9.5.3.16.2.3	Frequency – 50 Hz	
9.5.3.16.2.4	Phases – 3 phases	
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 or better	
9.5.3.16.2.11	Rated power freq. withstands – 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 (415/230VAC, 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 230 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: Lighting transformers shall be fed from 415VAC Emergency busbar section	
9.5.3.16.3	ISOLATION TRANSFORMER (INTERNAL): One (01) no. dry type isolation transformer of suitable capacity (minimum 30kVA) with the same specification as the lighting transformers, except the following:	
9.5.3.16.3.1	Capacity– As per OEM design requirement (30 kVA minimum)	
9.5.3.16.3.2	Voltage – 415/415 volts, Dyn11, neutral available for connection and solidly earthed.	
9.5.3.16.3.3	The isolation transformer shall be used to supply the general rig area lighting (230V Ph-N for PCR internal lighting/Engine house/compressor house lighting etc. & 230V Ph-N supply inside PCR, Powerpacks etc. Neutral of the isolation transformer shall be grounded solidly.	
9.5.3.16.3.4	Primary and secondary side terminations: 1. 3 core, suitably sized Copper cables 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 FEEDER PANELS: Apart from motor starter panels, feeders for certain other loads are also required, e.g. Hand tools, Effluent treatment plant, Logger house, Deviation bunk house, power tong, Vortex pump, BOP control panel, 100kVA Isolation transformer Hut 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 in PCRs:	
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.	
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9.5.3.20	INDICATIVE PCR STARTERS/FEEDERS				
9.5.3.20. A	Starter panels The starter/ feeders shall be inclusive but not limited to the following list:				
	Sl.	Motor Load (Indicative)	Application	Remarks	
	1	75/100 HP	Desander feed pump (ULMMC)		
	2	75/100 HP	Desilter feed pump (ULMMC)		
	3	75/100 HP	Mud Mix-1		
	4	75/100 HP	Mud Mix-2		
	5	100 HP	Super Charger-1	Cable size shall match motor HP	
	6	100 HP	Super Charger-2		
	7	100 HP	Super Charger-3		
	8	75/100 HP	Hydraulic Unit -1		
	9	75/100 HP	Hydraulic Unit -2		
	10	75/100 HP	Spare soft starter- 1	Cable size shall match motor HP	
	11	75/100 HP	Spare soft starter- 2		
	12	60/75 HP	Centrifuge unit		
	13	30/40 HP	Water Pump-1 Booster		
	14	30/40 HP	Water Booster Pump-2		
	15	20/30 HP	Trip Tank pump- 1		

	16	20/30 HP	Trip Tank pump- 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 Pump-1 Water	Cable size shall match motor HP	
	30	10HP	Ground Water Pump-2		
	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	10/15/20HP	Spare starter-3	Cable size shall match motor HP	
	47	10/15/20HP	Spare starter-4		
	48	10/15/20HP	Spare starter-5		
	49	30/40HP	Spare starter-6		
	50	3/5HP	Spare starter-7		
	51	5/7.5 HP	Spare starter-8		
	52	3/5HP	MP1-Mud Pump Lube		
	53	3/5HP	MP2-Mud Pump Lube		
	54	3/5HP	MP3-Mud Pump Lube		
	55	3/5 HP	Top drive blower Motor -1		
	56	3/5 HP	Top drive blower Motor -2		
	57	10/15 HP	Top drive lube oil motor		
	58	5/7.5 HP	Fuel Transfer Pump-1		
	59	5 /7.5 HP	Fuel Transfer Pump-2		
	60	5/7.5 HP	Chemical Mixing Tank		
	61	3/5HP	DW Lube-1		
	62	3/5HP	DW Lube-2		
	63	3/5HP	Degasser		
	64	3/5HP	Bug Blower		
	65	3/5HP	Shale Shaker-1A		
	66	3/5HP	Shale Shaker-1B		
	67	3/5HP	Shale Shaker-2A	Cable size shall match motor HP	
	68	3/5HP	Shale Shaker-2B		
	69	3/5HP	Shale Shaker-3A		

	70	3/5HP	Shale Shaker-3B		
	71	3/5 HP	RT Lube-1		
	72	10/15/20 HP	RT Blower Motor		
	73	3/5 HP	Mud Cleaner-1		
	74	3/5 HP	Mud Cleaner-2		
	75	15 HP	Resistor bank-1 blower motor		
	76	15HP	Resistor bank-2 blower motor		
	77	7.5/ 10 HP	LDO tank motor		
	78	10/15 HP	Sludge tank agitator motor		
	79	3/5/10 HP	Cellar pit motor		
	80	30/40 HP	Spare – 9		
	81	30/40 HP	Spare – 10		
	82	10/15/20HP	Spare – 11		
	83	10/15/20HP	Spare – 12		
	84	10/15/20HP	Spare – 13		
	85	10/15/20HP	Spare – 14		
	86	10/15/20HP	Spare – 15	Cable size shall match motor HP	
	87	10/15/20HP	Spare – 16		
	88	75/100 HP	Spare soft starter – 17		
	89	75/100 HP	Spare soft starter – 18		
	90	5/7.5 HP	Spare – 19		
9.5.3.20. B.	TENTATIVE MCC- Feeder Circuit Breakers Data (Indicative)				
	Sl. No	Rating	Application	Remarks	
	1	125 A	Compressor-1	Cable size shall match motor HP.	
	2	125 A	Compressor-2		
	3	800 A	(500) KVA DG Incomer		
	4	63A	ETP		

	5	125A	VFD PCR AC-1		
	6	125A	VFD PCR AC-2		
	7	63A	DRILLER CABIN HVAC		
	8	63A	DOG HOUSE CABIN HVAC		
	9	32 A	Deviation bunk		
	10	125 A	Area light DB		
	11	125 A	Lighting Transformer -1		
	12	125 A	Lighting Transformer -2		
	13	125 A	Central HPU		
	14	125 A	Iron rough neck HPU		
	15	100A	BOP Control panel Feeder		
	16	250 A	100kVA Isolation transformer hut (External)		
	17	63A	30kVA Isolation transformer (PCR) feeder		
	18	63A	Mud logging Unit		
	19	63A	Vortex pump		
	20	63 A	Spare		
	21	125 A	Spare		
	22	250 A	Spare		
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9.7.1	Grasshopper cable rack suitable for elevating with derrick floor shall be used for leading and supporting derrick floor cables draw work and top drive cables including control, lighting, and auxiliary motor cables. (Bidder to provide the manufacturing drgs & documents and BOM details, manufacturing shall be in BHEL scope)	
9.7.2	Grass hopper shall have sufficient cable storage area for coiling cable lying beyond cable extender towards derrick floor, during rig movement.	
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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 3000 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, 2023 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	Manufacturers' test reports/ certificates for all meters installed in all PCRs shall be provided	

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 hazardous area; Zone-1 or Zone-2 of oil mines. 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, 2023) 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, JBs, 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 (during bid submission) 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 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.) 4) Filled up "ELECTRICAL ANNEXURE (CHECK LIST FOR BIDDERS)" 5) Any other documents mentioned elsewhere in the tender	
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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	
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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	
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9.10.4.47	Dehumidifier – 3 nos.	
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9.10.5	SPARES: A. Commissioning spares: It is the responsibility of the supplier to provide adequate commissioning spares and consumables required during commissioning. B. Mandatory spares: Additionally, mandatory spares supplied shall be inclusive of but not limited to the list mentioned below: Quantity shall be as per section 3.8	

Sl. No.	Corresponding Section/ Clause	Description of Spare
1	9.10.5.1.1	a. DWS Motor (spare)-Main Drilling Motor
		b. MP Motor (spare)-Main Drilling Motor
		c. RT Motor (spare)-Main Drilling Motor
2	9.10.5.1.2	a. Blower unit (for drilling motors-DWS)-AC motors
		b. Blower unit (for drilling motors- MP)-AC motors
		c. Blower unit (for drilling motors- RT)-AC motors
3	9.10.5.1.3	Soft starter unit-PCR starter panel
4	9.10.5.1.4	Air Conditioner, Ex type for Driller's Cabin
5	9.10.5.1.5	Split Air Conditioner, Ex type for Dog House/ Tool Room (if applicable)
6	9.10.5.1.6	100/75 HP (3 Ph.) FLP Motor (as used in the rig package) for
		Super charger, mud mix, de- sander, de-silter etc.
7	9.10.5.1.7	Mud agitator / water agitator motor for Mud tanks/ Water tanks
8	9.10.5.1.8	Lube oil motors (if used) for Mud Pump / Draw Works/RT
9	9.10.5.1.9	40/30 HP motor for Water booster
10	9.10.5.1.10	Blower motor assembly for resistor bank (Dynamic brake)

11	9.10.5.1.11	VFD Converter/Rectifier module (for VFD Rectifier panel)
12	9.10.5.1.12	a. VFD Inverter module (for DWS VFD panels)
		b. VFD Inverter module (for MP VFD panels)
		c. VFD Inverter module (for RT VFD panels)
		d. VFD Inverter module (for TDS VFD panels)
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~~14~~	~~9.10.5.1.14~~	Deleted
15	9.10.5.1.15	Power transformer (600/415 VAC)-Spare
16	9.10.5.1.16	PLC/ SBC/PAC system spares (complete set-PLC, IOs, PS, IM etc.)
17	9.10.5.1.17	Air Conditioner for PCRs
18	9.10.5.1.18	Special maintenance tools for the drilling motors (as recommended by motor OEM)
19	9.10.5.1.19	Top Drive AC VFD Motor- Main motor
20	9.10.5.1.20	Top Drive Blower Motor
21	9.10.5.1.21	Top Drive Hydraulic Motor
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26	9.10.5.2.5	Control fuses of each type / rating (for PCR, Drillers cabin, MP console etc.)
27	9.10.5.2.6	Fuse holder set of each type (base and carrier) (for PCR, Drillers cabin, MP console etc.)

	28	9.10.5.2.7	Control switches of each type (for PCR, Drillers cabin, MP console etc.)
	29	9.10.5.2.8	Indicating meters of each type (for PCR, Drillers cabin, MP console etc.)
	30	9.10.5.2.9	Control pots of each type (for PCR, Drillers cabin, MP console etc.)
	31	9.10.5.2.10	Control relays of each type (for PCR, Drillers cabin, MP console etc.)
	32	9.10.5.2.11	Contactors of each type (for PCR, Drillers cabin, MP console etc.)
	33	9.10.5.2.12	a. Diodes for VFD Convereter/rectifier module (for complete bridge)
			b. IGBT for VFD module (for complete bridge)
	34	9.10.5.2.13	Power fuse and control fuse for diodes (rectifier section) of each type/rating
	35	9.10.5.2.14	Brake Chopper unit for DC Bus for Dynamic Braking (if applicable)
	36	9.10.5.2.15	Critical spare for VFD rectifier unit (PCB of each type (if any), HMI)
	37	9.10.5.2.16	Critical spare for Inverter/ VFD unit module (PCB of each type, HMI)
	38	9.10.5.2.17	Power and control fuse for VFD inverter unit of each type/rating
	39	9.10.5.2.18	a. Air circuit breaker/MCCB of each type for PCR–Generator panels
			b. Air circuit breaker/MCCB of each type for PCR–Rectifier panels
			c. Air circuit breaker/MCCB of each type for PCR–Transformer panels
			d. ACB/ Isolator/DC SFU of each type for PCR–Inverter panels (as applicable)
	40	9.10.5.2.19	Control / relay module for air circuit breaker of each type for PCR-generator/rectifier/ inverter/ transformer panels

41	9.10.5.2.20	Generator Panel spares (PCB of each type, Fuse of each type)
42	9.10.5.2.21	Generator control module for Generator panel
43	9.10.5.2.22	PCB of each type for MPcon/ D'con/ Ground fault/ synchronizing panel/ NGR system
44	9.10.5.2.23	Control/ regulating transformer of each type PCR- Generator/ rectifier/ inverter / MPcon/ D'con/ Ground fault circuit etc.
45	9.10.5.2.24	MCCB for AC motor starters of each Type PCR starter/ feeder Panels
46	9.10.5.2.25	Contactors for AC motors of each Type PCR starter/ feeder Panels
47	9.10.5.2.26	Overload relays of each type PCR starter/ feeder Panels
48	9.10.5.2.27	RCD/RCBO of each type PCR starter/ feeder Panels
49	9.10.5.2.28	Indication lamps of each type and colour
		PCR, D'con, MPcon etc.
50	9.10.5.2.29	HMI screen for generator panel
51	9.10.5.2.30	HMI screen for monitoring (with PLC HMI program)
52	9.10.5.2.31	Selector switch of each type Generator panel/ MP console/D'Con/Drillers cabin etc.
53	9.10.5.2.32	Components of synchronizing system
54	9.10.5.2.33	Electrical components of drillers cabin (PCB of each type, Switch of each type, Joystick, potentiometer etc)
55	9.10.5.2.34	a. Spare motor for Air compressor unit
		b. Spare motor for Hydraulic unit
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~~57~~	~~9.10.5.2.36~~	Deleted

	58	9.10.5.2.37	Plug and receptacle set of each type (used in PCR, Z- tray, D'con, MPcon, Derrick Floor,	
	59	9.10.5.2.38	PBS unit for AC motors	
	60	9.10.5.2.39	Emergency lamp for PCR	
	61	9.10.5.2.40	PCR anti panic lock set for PCR Doors	
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	~~63~~	~~9.10.5.2.42~~	Deleted	
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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 OR During 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 (including Alternator)	√	√	
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 3 000 HP VFD Drilling Rigs Refer Section 3.9		
9.10.10	TRAINING FOR ELECTRICAL Please refer section 3.3		

3.1.5. DRILLER CABIN INCLUDING DRILLING CONTROL SYSTEM WITH CCTV AND INTERCOMM CONTROL SYSTEM

1. DRILLER'S CONTROL CABIN & MUD PUMP CONTROL CONSOLE :

Driller's control cabin or D'con and Mud pump control console shall be integral parts of the rig control system. The D'CON should consist of the following minimum controls and display functions :

Driller's cabin		Bidder's Offer	Deviation from BHEL Requirement
1	HMI to enable the driller to monitor and control the entire drilling operation.		
2	Control switches to control main drive motors (manual switches or suitable provision in HMI)		
3	Indicators and meters		
4	Speed controllers to control speed and direction of various main motors.		
5	DW, Rotary, top drive, Mud pumps, Generator/engine parameters, VFD converter status/alarm etc.		
6	Supercharger pumps shall be started & stopped manually from Driller's Console.		
7	Two emergency stop buttons, one for the VFD system, and another for the Generator panel CBs/power packs (total power shutdown).		
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	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.		
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.		

2. DRILLING CONTROL SYSTEM :

A.	INTRODUCTION	Bidder's Offer	Deviation from BHEL Requirement
1	The complete rig control system envisaged should be for managing equipment installed on the rig. The system should have following features- 1. It should able to operate control and monitor different rig equipment like 1. Draw works 2. TDS 3. MUD Pump 4. Auxiliary - Iron rough Neck, Hydraulic Cat Walk, HPU, Hydraulic Cat- Head and casing running tool. 2. It should however be capable of displaying parameters from remaining equipment i.e. Instrumentation System and BOP.		

	• It should be designed to allow operator to focus on Drilling, Tripping, and Casing operation through interactive touch screen command systems. Primary Joystick control for equipment and secondary control on HMI is required. Also, physical switches required for ESDs. • It should have joystick based control for major equipment like Draw works and TDS, for ease of operation. • The command system of joystick and Touch screen should be installed inside a positively pressured driller's cabin for the use in Class1 Div2 conditions. System should be complied to IEC60079. • The system should include controller for all the major equipment, all the controllers to be placed in the Multi Tool Cabinet(s) (MTC) in side VFD House/PCR. • The MTC must have provision for a touch screen panel for monitoring and configuration of controller. • The configuration laptop along with the cables/software/Hardware required for configuration of the controller and other equipment is to be provided. • The system should have different alarms for warning operator. • Signal from BOP controller to be taken and displayed on the screen. Manifold pressure, Accumulator Pressure, Annular Pressure, rig air pressure, all BOP & HCR open close position. • The tendered software of the control System should		

	be capable of both for local and cloud based monitoring through industry acceptable communication protocols. The control system should include but not limited to the following minimum features- **A.** Command Centre/Drillers Chair with 1.HMI Touch Screens 2.Joysticks **B.** Tool Controller including 1. Draw Works Controller 2. TDS Controller 3. Mud Pump Controller 4. Power System Controller 5. Driller Chair Controller 6. Auxiliary Controller 7. Instrumentation Controller **C.** Multi-Tool Cabinet with Touch Screen for diagnosis **D.** Miscellaneous Components with 1. Online UPS system 2. ESD system for all the equipment 3. MCC Interface 4. Mud logger output module.		
B. COMMAND CENTRE /DRILLER CHAIR		**Bidder's Offer**	**Deviation from BHEL Requirement**
1	• The command centre must have joystick control for controlling major equipment. The joysticks must be installed on the hand rest for ease of operation		

	• The joystick must have some user configurable buttons. • The command centre must have touch screen panel which will be used for monitoring and control the major equipment. The touch screen must have brightness control to work under bright sunlight as well as under low light night condition. The chairs must have E-stop buttons for contingency situations.		
C. TOOL CONTROLLER:		**Bidder's Offer**	**Deviation from BHEL Requirement**
1	**Draw works controller** The draw works control module should be able to control the functions of the draw works against command received from joysticks or touch screen of the command centre. It should be able to access all the parameter from the I/O module of the draw works and display it on the screen. It should be able support following operation but not limited to **1.** Automatic drilling (Fix ROP/WOB/Delta P/Drilling Torque)**2.** Automatic reaming **3.** Drilling Operation **4.** Tripping Operation **5.** Automatic tubular tripping inside cased hole **6.** Draw woks status, motor, VFD status **7.** Diagnostics and Alarm **8.** Crown-o-matic and floor-o-matic stop		
2	**Top Drive Controller** The TDS control module should be able to control the functions of the TDS against command received from joysticks or touch screen of the command center. It should be able to access all the parameter from the I/O module of the TDS and display it on the screen. It should be able support following operation but not limited to **1.** TDS operation **2.** Diagnostics and Alarm		

3	**Mud Pump Controller** The Mud Pump control module should be able to control the functions of the Mud Pump against command received from joysticks or touch screen of the command center. It should be able to access all the parameter from the I/O module of the TDS and display it on the screen. It should be able support following operation but not limited to **1.** Mud Pump operation **2.** Diagnostics and Alarm		
4	**Driller's Chair Controller** The drillers chair controller should be able to read the command from the joysticks and touch screen. It should have facility for control of wiper system for driller's cabin.		
5	**Instrumentation controller** The MSI controller must be able to Monitor and display all the drilling parameters. The detail specification of the system in given in the instrumentation system		
6	**Auxiliary Controller** The controller should be able to control the functions of **the Iron rough Neck, Hydraulic Cat Walk, HPU, casing running tool, Cat-Head**		

D. PROVISION OF OUTPUT SIGNAL TO MUD LOGGER SYSTEM:

Provision of Output Signal to Mud Logger system		**Bidder's Offer**	**Deviation from BHEL Requirement**
1	The system must have a provision to give following signal output to the mud logger unit with output in 4-20mA/0-10V WITSML/MODBUS: Hook Load, Pump Pressure, TDS speed, TDS torque, Mud Pump 1 SPM, Mud Pump 2 SPM, Mud Pump 3 SPM, Total Gas, Return Flow		

E.	**OTHER REQUIREMENT**	**Bidder's Offer**	**Deviation from BHEL Requirement**
1	Other requirement: • System should have zone management for different equipment installed so that they do not hit each other while working • Different operational interlocks should be there between the equipment for safety of man and machines • The system should also have Top drive link auto float system / drawworks stoppage for Monkey Board protection system • The system must have software assurance package for future update/upgrades till the system become obsolete • The system must have capability of recording data for user selected parameter for maintenance and troubleshooting • Visual and easy accessible operator screens for all the toll controller are to provide for easy operation • graphical/pictorial display to develop for different controller • all cable layout should be such that there is no interference between the		

	signal and power cable and to be submitted to OIL for final approval • Interlock between IBOP and mud Pump • Open architecture for accommodating third party software. However, drilling control system should be able to run basic user defined external algorithms (logic statements) not interfering with the core control • strategies and command/signal from third party system • The software should be of latest version at the time of delivery • Remote touch screen / Wireless Controller with physical buttons & hand held wireless operation panel for operating Catwalk and mast raising system		
2	**HMI DISPLAY PANEL / WORKSTATION:** a) Touch screen HMI display panel or workstation (minimum screen size 17 inch) 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, viewing of historical data & trends etc. shall be able to do from this unit. b) HMI display panel of driller's cabin shall be Class 1, Zone 1/2		

	certified. c) One more Workstation / HMI (screen size 19 inch) with A3 size Laser colour printer shall be provided at Drilling-in-charge bunk house for viewing of all the drilling parameters. Settings like set point adjustment, alarm set points, viewing of historical data & trends etc. shall be able to do from this workstation. 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. **Licensed latest Windows based Operating System with minimum 3-years subscription Antivirus Software shall be provided for the HMI display panel / Workstation.**		
3	CABLES: a. 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. b. Cable glands shall be suitable for using at classified hazardous area. c. 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).		
4	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.		

3.0 INTERCOM/PUBLIC ADDRESS SYSTEM/ALARM

INTERCOM/PUBLIC ADDRESS SYSTEM/ALARM		Bidder's Offer	Deviation from BHEL Requirement
1	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. **Online UPS of proper rating shall be provided for uninterrupted operation of the system.**		

4.0 CCTV SYSTEM :-

CCTV SYSTEM		Bidder's Offer	Deviation from BHEL Requirement
1	**CCTV SYSTEM:** CCTV system for round the clock		

	monitoring of drilling operation and rig equipment shall be provided. The details of the system is as follows: a) PTZ Camera: 5 Nos. Locations: 1. Monkey Board (for vertical pipe handler) 2. Rig Floor Area 3. Shale Shaker area & all Mud tanks 4. Cellar Pit Area 5. Near Inclined Walk (for catwalk & pipe ramp) b) Bullet Fixed Camera: 4 Nos. 1. Drawworks 2. Mast (For Casing Operation) 3. Diesel Tank & Engine area 4. Mud Pump c) Display Monitor (for displaying video output) & control of camera operation in the driller's cyber chair shall be provided. d) CCTV server & storage device shall be provided in the DAS bunk house. One display unit of minimum 17-inch screen size with control of camera shall be provided in the DAS bunk house & one display unit of 32 inch size at Drilling-in-charge cabin. The Display unit shall be able to display any one single camera view as well as all camera views in split screen. Each display unit shall be individually configurable. e) 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. f) The CCTV system shall have scalability to add more camera (at least 4 nos.) & enhancement of storage as per		

	OIL requirement. g) The CCTV system shall be equipped/integrated with video analytics tools/application to minimum identify Flame and Smoke detection, Fall detection (person fall/collapse) and Personal Protective Equipment (PPE) status: safety helmet, shoes, coverall. The system shall generate analytics report and alarm (audio/visual) on any incident. h) The CCTV system including camera must be ONVIF compliant for future integration to any third-party central VMS system.		
2	**Camera:** 1. Shall have minimum 4 MP resolution. 2. Shall be pan/tilt/zoom (PTZ) type or Bullet fixed type True IP camera (as per locations mentioned under 10.4). 3. All camera shall be Motorized Varifocal with minimum 22X optical zoom. 4. Shall have certification for use in Hazardous Area Zone-1, Class-I, Division-1 & 2, Group C & D. Camera & housing shall be of same make. 5. Shall be fitted with explosion proof fittings and FLP junction boxes in the hazardous area. 6. All camera enclosure shall have IP66 or higher. 7. Operating environment: 0 to 50 degC, 10 to 90 %RH (non-condensing). 8. Shall be equipped with defogger, wiper & washer system. 9. Shall have minimum		

	illumination of Color: 0.01 Lux & B/W: 0.001 Lux. Capable for Day/Night Vision (Low flux). 10. All cables, power or signal cables shall be armoured. The cables (wherever required) shall have sufficient length to carry out pad drilling 1 + 2 (minimum 30 meter extra). 11. All CCTV signal cables shall be routed separately in a channel/compartment of cable trays (not along with power cables). 12. Bidder shall consider necessary Mounting arrangement & pole, as required for installation of CCTV camera at the designated locations.		
3	**CCTV Display Monitor in Driller's cabin:** 1. Shall be able to display any one single camera view as well as all camera views in split screen. Shall have certification for use in Hazardous Areas Zone-1 / Zone-2, Class-I, Division-1 & 2, Group C & D.		

5.0 SPECIAL POINTS:

A. SAFETY COMPLIANCE

Technical Specification		Bidder's Offer	Deviation from BHEL Requirement
1	All the above systems, Control System of Rig Equipment, Intercom/PA system & CCTV system and 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		
2	Bidder shall provide all system hardware along with field instruments/sensors suitable for use in Zone-2, 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.		
3	All such test certificates, and approvals (if required) shall be submitted during FAT/inspection by OIL engineers.		

6.0 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) –

Inspection of equipment by OIL		**Bidder's Offer**	**Deviation from BHEL Requirement**
1	Physical verification/inspection of all the items/fittings/accessories including all Parts Catalogue, Maintenance & Service Manuals, Schematics.		

2	Operational / functionality testing of each & every system under load (if applicable) / no load. Performance parameters shall match quoted specifications.		
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.		
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.		
5	Supplier to inform 60 days in advance for inspection of the major electrical equipment as well as the complete rig package.		
6	Supplier will affect dispatch of the unit only on receipt of OIL's dispatch advice.		

7.0 THE INSPECTION STRATEGY SHALL BE AS FOLLOWS:

Sl No	Item	Intermediate Assembly of individual equipment, after FAT, at manufacturer's works	Complete, integrated rig package, at BHEL, before dispatch for string and load test

1	Driller Cabin, MP Console CCTV system, & Intercom system	√	√

FAT – Field Acceptance tests / Manufacturers standard acceptance procedures, valid for that stage of manufacture. Inspections of individual equipment – equipment include the PCRs, Power Packs etc.

8.0 INSTALLATION AND COMMISSIONING:

The installation and commissioning of all Rig Instrumentation systems of Complete Rig Package involves Two (2 Stage) Commissioning as described below:

Sl. No	Stages	Scope	Confirmation to be filled by Bidder
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.	
2	Initial commissioning after start up connection	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	

3	Final commissioning	All equipment of the Rig shall be integrated 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 control systems and equipment as well as the integrated system shall function as intended.	

3.1.6. RIG INSTRUMENTATION

Rig Instrumentation System

	SECTION-10 : RIG INSTRUMENTATION	Bidders Remarks: (Confirmed/Not Confirmed/Deviation) Additionally, bidder to provide brief details including make, model, key specification parameters etc., of their offered equipment/items and additional remarks, if any. Relevant File Location in the Bid to support the remarks/compliance.
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: a. 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 Drilling-in-charge bunk house, A3 size colour printer along with licensed application softwares with lifetime validity. The scope shall also include providing access (like passwords) at all levels of all the systems. b. 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 16 ft. (L) X 8 ft. (W) with partition 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. c. Supply of proper rated UPS for the system and the same shall be housed preferably along with Data Acquisition system in the Bunk House. d. Smoke Detection & Alarm System with hooter mounted outside shall be provided in the Bunk House. Minimum two nos. of detector (Photoelectric or Ionized type) shall be provided in the equipment installed area of the bunk house. e. Bidder shall provide suitable storage arrangement in the bunk house for safe transportation of Rig Instrumentation Systems i.e. field instruments, cables, CCTV cameras, Gas sensors, Intercom units installed in the field area etc. during Inter Location Movement of the rig.	
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. Hole Depth ii. Bit Depth iii. Block Height iv. Hook Load v. Weight on Bit	

	vi. Stand Pipe Pressure vii. Casing Pressure viii. Tong Line Pull ix. ROP x. Ton Mile xi. Top Drive / Rotary RPM xii. Top Drive / Rotary Torque xiii.. Pump SPM (Pump1/Pump2/Pump3) xiv. Total SPM (Pump1+Pump2+Pump3) xv. Pump Strokes (Pump1/Pump2/Pump3) xvi. Total Strokes (Pump1+Pump2+Pump3) xvii. Tank Volume (All Available Mud Tanks) xviii. Active Tank Volume xix. Total Tank Volume xx. Loss/Gain Volume xxi. Trip Tank Volume xxii. Loss/Gain Trip Tank Volume xxiii. Mud Flow rate In & Out xxiv. Mud Density In & Out xxv. Mud Density Out xxvi. Mud Temperature In & Out xxvii. Mud Conductivity In & Out xxviii.Choke Manifold Pressure xxix. Cementing Pressure xxx. LEL concentration of all LEL sensors xxxi. H2S concentration of all H2S sensors.	
10.1.3	HMI DISPLAY PANEL / WORKSTATION: a) Touch screen HMI display panel or workstation (minimum screen size 17 inch) 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, viewing of historical data & trends etc. shall be able to do from this unit.	
	b) HMI display panel of driller's cabin shall be Class 1, Zone 1/2 certified. c) One more Workstation / HMI (screen size 19 inch) with A3 size Laser colour printer shall be provided at Drilling-in-charge bunk house for viewing of all the drilling parameters. Settings like set point adjustment, alarm set points, viewing of historical data & trends etc. shall be able to do from this workstation. 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. d) Licensed latest Windows based Operating System with minimum 3-years subscription Antivirus Software shall be provided for the HMI display panel / Workstation.	

10.1.4	DATA SERVER & STORAGE SYSTEM: a) 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. b) Industrial type, rugged, reliable and high performance Redundant Data Server of reputed make with minimum configuration dual processor, 16GB RAM, 21" TFT LCD Monitor, 1 TB HDD (2 Nos.), DVD +/- RW, LAN card and Internal Modem are to be provided. Licensed latest Windows based operating software, minimum 3-years subscription Antivirus Software and Licensed 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. c) The server must have 5 years onsite OEM warranty with remote diagnosis. d) Hot redundancy of data server & storage shall be ensured. Primary assigned server shall be able to operate standalone in the absence of redundant server without any issue. e) 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. f) Suitable Server rack (s) in the DAS Bunk House shall be considered for all servers, network accessories, UPSs etc.	
10.1.5	CABLES: a. 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. b. Cable glands shall be suitable for using at classified hazardous area. c. 10% spare cable pairs/glands/connectors should be provided for future use. d. All cables shall have sufficient length to carry out 4+1 cluster well on a straight line/ diagonally or to reach up to 120 m from PCR/ DAS Bunk House, whichever is higher.	
10.1.6	UNINTERRUPTED POWER SUPPLY: a. 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. b. 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 along with necessary configuration cables shall be supplied. Requisite calibrated application softwares 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: c. Bidder shall provide filed sensors/hardwares suitable for use in Zone-1, 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. d. The test certificates from relevant laboratory shall be submitted to the inspection agencies at the time of inspection prior to despatch of materials. e. The system shall provide Intrinsically Safe power to all the sensors installed on the hazardous locations.	
10.1.11	LIST OF SENSORS: a. Weight Indicator sensors b. Mud volume sensors c. Return flow sensor d. Electronic depth measuring sensor/encoder e. SPM Sensors for Pumps f. Pressure transducers (types as applicable) g. Rotary & Top Drive RPM sensor h. Rotary & Top Drive Torque sensor i. Mud Temperature sensors (In and Out) j. Mud Density sensors (In and Out) k. 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. 3. All sensors shall have operating & storage temperature of 0 to +50 degC & Humidity of 10 to 90	

10.2	ONLINE GAS MONITORING SYSTEM: The online gas monitoring system shall consists of but not limited to the following: 1. Three (3) nos. of fixed LEL detector (Infra-Red Type) one each for Rig floor, Shale shaker &Riser mouth of range 0-100 %LEL. 2. Three (3) nos. of fixed H2S detector one each for Rig floor, shale shaker & riser mouth of range0-100 PPM. 3. Gas detectors shall be suitable for use in Hazardous Zone-1, Class-I, Division-1 & 2, Group C& D with IP 66 or higher. 4. One controller cum display unit 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. Full version software for controller configuration, downloading the configuration & uploading the historical data shall be provided. 5. Two (2) nos. of weatherproof and flameproof Hooter cum Flasher common for all gas sensors at Rig Floor & near Shale Shaker. 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 for 4+1 cluster well on a straight line/ diagonally or to reach up to 120 m from DAS Bunk House, whichever is higher. 8. Online UPS of proper rating shall be provided for uninterrupted operation of the system. 9. Controller shall have scalability to add additional 2 (two) nos. of LEL/H2S sensor. 10. Online Gas Monitoring System shall have to be integrated with DAS for monitoring & storingof data in the Data Acquisition System.	
10.3	INTERCOM/PUBLIC ADDRESSING SYSTEM: One suitable wireless/wired intercom system for the rig shall be supplied as per following details- a) Ten (10) nos. of Microphone & Speakers shall be placed at all following locations: 1. DIC Room, 2. Derrick Floor, 3. Driller's Cabin, 4. Dog House, 5. VFD House 6. Monkey Board, 7. AC PCR, 8. Utility System, 9. Assembly Point 10. DAS Bunk House 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 meter 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.	
10.3.1	DELETED	

10.3.2	DELETED	
10.4	CCTV SYSTEM: CCTV system for round the clock monitoring of drilling operation and rig equipment shall be provided. The details of the system is as follows: a) PTZ Camera: 5 Nos. Locations: 1. Monkey Board (for vertical pipe handler) 2. Rig Floor Area 3. Shale Shaker area & all Mud tanks 4. Cellar Pit Area 5. Near Inclined Walk (for catwalk & pipe ramp) b) Bullet Fixed Camera: 4 Nos. 1. Drawworks 2. Mast (For Casing Operation) 3. Diesel Tank & Engine area 4. Mud Pump c) Display Monitor (for displaying video output) & control of camera operation in the driller's cyber chair shall be provided. d) CCTV server & storage device shall be provided in the DAS bunk house. One display unit of minimum 17-inch screen size with control of camera shall be provided in the DAS bunk house & one display unit of 32 inch size at Drilling-in-charge cabin. The Display unit shall be able to display any one single camera view as well as all camera views in split screen. Each display unit shall be individually configurable.	
	e) 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. f) The CCTV system shall have scalability to add more camera (at least 4 nos.) & enhancement of storage as per OIL requirement. g) The CCTV system shall be equipped/integrated with video analytics tools/application to minimum identify Flame and Smoke detection, Fall detection (person fall/collapse) and Personal Protective Equipment (PPE) status: safety helmet, shoes, coverall. The system shall generate analytics report and alarm (audio/visual) on any incident. h) The CCTV system including camera must be ONVIF compliant for future integration to any third-party central VMS system.	

10.4.1	Camera: 1. Shall have minimum 4 MP resolution. 2. Shall be pan/tilt/zoom (PTZ) type or Bullet fixed type True IP camera (as per locations mentioned under 10.4). 3. All camera shall be Motorized Varifocal with minimum 22X optical zoom. 4. Shall have certification for use in Hazardous Area Zone-1, Class-I, Division-1 & 2, Group C & D. Camera & housing shall be of same make. 5. Shall be fitted with explosion proof fittings and FLP junction boxes in the hazardous area. 6. All camera enclosure shall have IP66 or higher. 7. Operating environment: 0 to 50 deg C, 10 to 90 %RH (non-condensing). 8. Shall be equipped with defogger, wiper & washer system. 9. Shall have minimum illumination of Color: 0.01 Lux & B/W: 0.001 Lux. Capable for Day/Night Vision (Low flux). 10. All cables, power or signal cables shall be armoured. The cables (wherever required) shall have sufficient length to carry out pad drilling for 4+1 cluster well on a straight line/ diagonally or to reach up to 120 m from DAS Bunk House, whichever is higher. 11. All CCTV signal cables shall be routed separately in a channel/compartment of cable trays (not along with power cables). 12. Bidder shall consider necessary Mounting arrangement & pole, as required for installation of CCTV camera at the designated locations.	
10.4.2	CCTV Display Monitor in Driller's cabin: 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 / Zone-2, Class-I, Division-1 & 2, Group C & D.	

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: The following are the list of some calibration equipment & special tools that shall be supplied along with each Rig. Bidder to supply all special tools/calibration equipment required for maintenance of Rig Instrumentation: 1. One (1) no. of IS Multifunction Process Calibrator with suitable Hand pump & pressure modules & fittings for 10000 psi. Accessories like test leads, alligator clips, battery, charger, case, national/international traceable calibration certificate shall be provided. 2. One (1) no. of IS Digital Multimeter with a test leads, alligator clips, battery, charger, national/international traceable calibration certificate.	

	3. One (1) no. of 4 – 20 mA Source/Loop Calibrator with battery, case & national/international traceable calibration certificate. 4. One (1) no of Digital Clamp Meter with accessories (test leads, carrying case & national / international traceable calibration certificate. 5. One (1) no. of RJ-45 Crimping Tool. 6. One (1) set of Calibration Adapter and calibration kit for LEL Sensors with LEL Gas cylinder (with minimum 1 year validity gas composition certificate). 7. One (1) set of Calibration Adapter and calibration kit for H2S Sensors with H2S Gas cylinder (with minimum 1 year validity gas composition certificate). 8. One (1) no. of IS 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). 9. One (1) no. of 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).	
10.7	DOCUMENTATION: a. Process and Instrument diagram of all systems – Two (2) sets b. Interconnection drawings and make and ratings of all components – Two (2) sets c. O&M manuals, equipment catalogues and test certificates – Two (2) sets d. 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 - Two (2) sets e. All the restore software, factory reset images and configurations to be provided after final commissioning. Minimum 2 (two) sets of Back-up images of all Servers, HMI/Workstation & Laptop shall be provided in suitable separate storage drive.	

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, Drilling in-charge 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.	
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 Zone-1, Class-I, Division-1 & 2, Group C&D with SIL 2/3 hazardous area as applicable for On-land drilling	
	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: 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. Data Acquisition System Controller with base, Power Supply module & Input / Output module b. Driller's cabin HMI for Data Acquisition System c. Weight Indicator sensor d. Mud volume sensor e. Return flow sensor f. SPM Sensor for Pumps g. Pressure transducers h. Mud Density sensor i. Mud temperature sensor j. Encoder k. RPM sensor l. Torque sensor m. Mud Conductivity Sensor Note: Quantity as per SECTION-3.8 (Mandatory Spares) [B] Online Gas Monitoring System a. Gas detector – LEL b. Gas detector - H2S c. Sensor for Gas Detector – LEL d. Sensor for Gas Detector - H2S e. All PCB cards/modules of Gas Monitoring controller cum display unit f. Weatherproof and flameproof Hooter cum Flasher Note: Quantity as per SECTION-3.8 (Mandatory Spares) [C] CCTV system a. PTZ Camera	

	b. Bullet Fixed Camera c. Cables used for Camera system d. Cable Glands e. Connectors (Male and Female) f. CCTV system controller g. CCTV Display Monitor of DCC Note: Quantity as per SECTIO 3.8 Mandatory Spares) [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 SECTION- 3.8(Mandatory Spares) [E] Other Controls a. Spares for monitoring and control of Drawworks b. Spares for monitoring and control of Top Drive c. Spares for monitoring and control of Hydraulic Cathead d. Spares for monitoring and control of Iron Roughneck e. All joysticks along with control cards in driller's cabin f. Spares for monitoring and control of vertical pipe handling system g. Spares for monitoring and control of Hydraulic Catwalk Note: Quantity as per SECTION-3.8 (Mandatory Spares) & as applicable to the respective rig equipment.	
10.10.3	ANNUAL MAINTENANCE CONTRACT: Please Refer Section 3.9	
10.10.4	TRAINING: Please refer section 3.3	

Notes:

- **i)** Provision should be made for accepting Top drive RPM & Torque Signals and displaying the same as indicated above.
- **ii)** Provision should be made for accepting different engine signals other Equipment and displaying the same as indicated above.
- **iii)** The display unit should have provision for configuration of following set points, alarms etc. from the display panel as well as from the remote server.
- **iv)** Bit Weight Zero Set
- **v)** Loss/Gain Zero Set
- **vi)** Tank Select
- **vii)** Total Strokes Reset
- **viii)** Setting alarms for different signal
- **ix)** Setting value of MUD weight

3.1.7. PIPE HANDLING SYSTEM

PIPE HANDLING SYSTEM – One Set (Includes 1 no. of Iron Rough Neck, 1 no. of Hydraulic Catwalk System, 1 no. of Power slip) Note:- Vertical pipe racker is not in scope however, Bidder shall have to integrate Pipe racker controls into Driller's cabin

	BHEL REQUIREMENT		Bidders Remarks: (Confirmed/Not Confirmed/Deviation) Additionally, bidder to provide brief details including make, model, key specification parameters etc., of their offered equipment/items and additional remarks, if any. Relevant File Location in the Bid to support the remarks/compliance (File Name & Page no. to be mentioned)
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 (pipe body)	3-1/2 inch to 9-3/4 inch Connection OD : 4 inch to 9-3/4 inch	
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 inch (between min. & max)	
3.1.4.7	Vertical Adjustment	36" (Min.)	
3.1.4.8	Connection Height	30 to 66 inch (min. to max)	
~~3.1.5~~	~~DELETED~~		
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	DELETED	
3.1.8	Tightening torque should be measured and stored in the instrument system.	
3.1.9	Hydraulic power source – Centralized hydraulic power unit or stand-alone hydraulic power unit	
3.1.10	Hazardous Area Classification: Zone 1 (Complete Iron Roughneck)	
3.1.11	Following spares per rig to be supplied. Dies, Rollers & one set of hydraulic hoses. Note: Quantity as per Annexure AA (Mandatory Spares)	

3.2	**CATWALK WITH RUNNERS (PIPE RACKS):**	
	One Power Catwalk capable to handle various sizes of tubulars & casings , subs consisting of Catwalk, Pipe rack, Carrier, V-door rack, and other associated components and designed to be operated remotely from Drillers Cabin as well from Ground Hydraulic unit for power catwalk system and other associated items. HYDRAULIC CATWALK: FEATURE 1. One (1) Hydraulic Catwalk suitable for Rig floor height (minimum 35 Ft). 2. It should be capable of handling pipes (Drill pipes, Drill Collars, Subs ,Casing and Tubing) of diameter 2 3/8" to 24" including drill collars up to 10 Inch. 3. Remotely operated hydraulic Gull wings shall be provided on both sides for aiding in the process of handling tubular from both sides. 4. The unit complete with Pipe Indexers, hydraulic levelling jack, Tubular lay down shovel, emergency stop button strategically placed shall be provided. 5. V-door ramp functionality shall be maintained if Hydraulic catwalk control system is not working. Technical specification : 1. Lifting capacity: 10,000 lbs. 2. Tubular range: Drill Pipe (2 3/8" to 6 5/8" Pipe body OD). Drill Collars : Up to 10" OD. Casing Size: Up to 24" OD 3. Maximum Pipe length : 45 ft 4. Cycle time : Approx. 20 sec (Moving pipe in and out from Catwalk not included). The unit shall also have	

	provision for wireless remote operation control . V door Ramp can be used as conventional V door if required. V door shall be hinged to catwalk. Standalone hydraulic unit for Hydraulic power. The hydraulic catwalk should be designed to facilitate ease of transportation so that the overall dimensions of individual components meet the transportation dimensions (Ref. to SECTION 3.5) . NOTE : 1--Pipe Racks with indexers to transfer tubular to and from either side of the catwalk. 2--Tubular Handling capabilities of Hydraulic Catwalk: Carrier to allow presentation of tubular to drill floor at correct angle and height to facilitate safe and efficient transfer to and from the elevator. Catwalk to have safety pins that engage automatically to prevent inadvertently rolling off of tubular from Carrier with separate hydraulic power unit	
	Catwalk: Features	
3.2.1	One (1) Hydraulic Catwalk 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. Bidder to indicate Cycle speed of hydraulic catwalk.	
3.2.3	Remotely operated hydraulic Gull wings shall be provided on both sides for aiding in the process of handling tubular from both sides.	
3.2.4	The unit complete with Pipe Indexers, hydraulic levelling jack, Tubular lay down shovel, emergency stop button strategically placed shall be provided	
3.2.5	V-door ramp functionality shall be maintained if Hydraulic catwalk control system is not working.	
3.2.6	Technical Specification:	
3.2.6.1	Lifting capacity 10,000 lbs	
3.2.6.2	Tubular range :	
	Drill Pipe 2 3/8" thru 6 5/8" OD	
	Drill Collars Upto 10" OD	
	Casing size Upto 20" OD	
3.2.7.1	Clause deleted	
3.2.7.2	The unit shall also have provision for wireless remote operation control as well as from the unit	
3.2.8	Catwalk should have an inbuilt system to automatically measure pipe lengths and input to drilling control system for making pipe tally automatically.	
3.2.9	The hydraulic 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 hydraulic 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 must conform to API-7K 5th edition 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 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 Annexure AA (Mandatory Spares)~~		
~~3.5~~	~~DELETED~~		

~~3.6~~	~~**VERTICAL PIPE HANDLING SYSTEM** :~~	
~~3.6.1~~	~~Pipe handling system for performs all vertical pipe handling operations on the drillfloor, including racking stands in & out from finger board to well centre & Mouse hole , picking up singles from the V-ramp & laying down , The machine should have be operated in auto mode, manual mode. To handle all types of pipe, including production tubing, drillpipe, casing, and spiral drill collar. Using AC technology or hydraulic .~~	
~~3.6.2~~	~~Handling Stand length : Average length of stand 28 to 30 mt.~~	
~~3.6.3~~	~~Handling pipe range : 2 7/8" tubing to 9 ½" Drill collar including spiral drill collar . Casing & liner size 4 " to 20"~~	
~~3.6.4~~	~~□ Versatile for handling of triple or single , as well as assistance in handling smaller bits, subs, and objects~~ ~~□ Upper and lower guide arm adjustable vertically for different stand lengths~~ ~~□ Robust design with well protected sensors~~ ~~□ User friendly human machine interface (HMI) with onscreen operator guidance~~	
	~~□ Fail safe design~~ ~~□ All operations controlled from the drilling control room~~	

3.1.8. DRIVE MOTOR SPECIFICATIONS:

	BHEL REQUIREMENT	Bidders Remarks: (Confirmed/Not Confirmed/Deviation) Additionally, bidder to provide brief details including make, model, key specification parameters etc., of their offered equipment/items and additional remarks, if any. Relevant File Location in the Bid to support the remarks/compliance (File Name & Page no. to be mentioned)
9.1	DRIVE MOTOR SPECIFICATION	

9.1.1	DRAW WORKS Motor Specifications:	
9.1.1.1	AC motor, inverter duty rated, suitable for driving 3000 HP draw-works.	
9.1.1.2	Make: Refer to section 3.6(List of preferred makes)	
9.1.1.3	Type: Explosion proof type, suitable for use in hazardous Gas atmospheres, IP 44 minimum (As per IS/IEC 60034-5).	
9.1.1.4	Gas groups: IIA & IIB	
9.1.1.5	Quantity: As per OEM design & suitable for above draw-works	
9.1.1.6	Electrical rating (HP rating): As per OEM design & suitable for above draw- works	
9.1.1.7	RPM range at constant torque: As per OEM design & suitable for above draw- works	
9.1.1.8	RPM range at continuous full horse power: As per OEM design & suitable for above draw-works	
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 VAC, 50 Hz rated	
9.1.1.18	Space heaters to be provided	
9.1.1.19	Motor electrical parameters to be provided by bidder (rated Voltage, Current, Freq. etc.)	
9.1.1.20	RTD provision for monitoring winding temperature	
9.1.1.21	Maximum Torque: As per OEM design & suitable for above	
9.1.2	Rotary Drive Motor Specifications:	
9.1.2.1	AC motor, inverter duty rated, suitable for driving the rotary table	
9.1.2.2	Make: Refer to section 3.6(List of preferred makes)	
9.1.2.3	Type: Explosion proof type, suitable for use in hazardous Gas atmospheres, IP 44 minimum (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 (HP rating): As per OEM design & suitable for Independent Rotary Table Drive mentioned in clause 2.5	
9.1.2.7	RPM range at constant torque: As per OEM design & suitable for above IRD	
9.1.2.8	RPM range at continuous full horse power: As per OEM design & suitable for above IRD	
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 heaters to be provided	
9.1.2.19	Motor electrical parameters to be provided by bidder (rated Voltage, Current, Freq. etc.)	
9.1.2.20	RTD provision for monitoring winding temperature	
9.1.2.21	Maximum Torque: As per OEM design & suitable for above	
9.1.3	TOP DRIVE Motor Specifications:	
9.1.3.1	AC motor, inverter duty rated, suitable for HP & torque requirement as mentioned in Top Drive section (Section 3.1.2).	
9.1.3.2	Type: Explosion proof type, suitable for use in hazardous Gas atmospheres, IP 44 minimum (As per IS/IEC 60034-5).	
9.1.3.3	Gas groups IIA & IIB	
9.1.3.4	Quantity: As per OEM design & suitable for above	
9.1.3.5	Electrical rating (HP rating): As per OEM design & suitable for TDS as mentioned in Top Drive Section 3.1.2	
9.1.3.6	RPM range at constant torque: As per OEM design & suitable for above	
9.1.3.7	RPM range at continuous full horse power: As per OEM design & suitable for above	
9.1.3.8	Temp. rise: T3 (200 C)	
9.1.3.9	Duty: Continuous drive with constant torque, at 55 Deg. Centigrade	
9.1.3.10	Stator insulation: Class H VPI	
9.1.3.11	Bearing: heavy duty roller bearing, re-greasable	
9.1.3.12	Single shaft with hub	
9.1.3.13	Main terminal box with IP56 protection minimum	
9.1.3.14	Terminal box should be easily accessible for connection	
9.1.3.15	Differential pressure switch (air flow relay/switch) for pressure sensing	
9.1.3.16	Blower assembly with suitable capacity explosion proof motor, 415 or 600 VAC, 50/60 Hz rated	
9.1.3.17	Space heaters to be provided	
9.1.3.18	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)	
9.1.3.19	Motor electrical parameters to be provided by bidder (rated Voltage, Current, Freq. etc.)	
9.1.3.20	RTD provision for monitoring winding temperature	
9.1.3.21	Maximum Torque: As per OEM design & suitable for above	
9.1.4	MUD PUMP DRIVE MOTORS Specifications:	
9.1.4.1	AC motor, inverter duty rated, suitable for driving the Mud	

	pumps of capacity as mentioned in Section 3.1.3	
9.1.4.2	Make: Refer to section 3.6 (List of preferred makes)	
9.1.4.3	Type: Explosion proof type, suitable for use in hazardous Gas atmospheres, IP 44 minimum (As per IS/IEC 60034-5).	
9.1.4.4	Gas groups IIA & IIB	
9.1.4.5	Quantity: As per OEM design & suitable for Mud pump as mentioned in Section 3.1.3	
9.1.4.6	Electrical rating (HP rating): As per OEM design & suitable for above Mud- pump	
9.1.4.7	RPM range at constant torque: As per OEM design & suitable for above	
9.1.4.8	RPM range at continuous full horse power: As per OEM design & suitable for above	
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 heaters to be provided	
9.1.4.19	Motor electrical parameters to be provided by bidder (rated Voltage, Current, Freq. etc.)	
9.1.4.20	RTD provision for monitoring winding temperature	
9.1.4.21	Maximum Torque: As per OEM design & suitable for above	
9.1.5	STATUTORY REQUIREMENTS FOR THE VFD DRILLING 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 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	415VAC AUXILIARY MOTORS	
9.1.6.1	Motors shall be rated for 415 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 Hazardous	

	areas of oil mines; Zone 1 & 2, Gas groups IIA & IIB.	
9.1.6.3	Motors shall be fitted with Ex-certified cable glands/FLP double compression cable glands, terminal studs and earthing leads for connection to common earth bus. Plug-in type cable connections are not permissible at motor end.	
9.1.6.4	Capacity: All auxiliary motors shall be per OEM design requirement, unless specified by OIL	
9.1.6.5	Make: Bharat Bijlee, Kirloskar, Marathon motors, Crompton Greaves, ABB, Cemp, Nidec, Siemens, LHP, WEG or equivalent.	
9.1.6.6	All motors shall be supplied with local Push Button Station (PBS). Push Button Station (PBS) for all motors shall be located near the motor. The details of PBS have been included in section 3.1.4 of Electrical Specifications.	
9.1.7	STATUTORY REQUIREMENTS FOR 415VAC AUXILIARY MOTORS	
9.1.7.1	The motors, all its auxiliaries & cable glands 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.	
9.1.7.2	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	**RIG ALTERNATOR (NOT IN SCOPE OF BIDDER) FOR INFORMATION ONLY**	
9.2.1	Alternator specification:	
9.2.1.1	Rated voltage: 600VAC	
9.2.1.2	Make: Refer to section 3.6 (List of preferred makes)	
9.2.1.4	Power factor: max. 0.75	
9.2.1.5	Phases: Three phase, three wire, star connected with ungrounded neutral (neutral shall be floating). Neutral shall be available at terminal box.	
9.2.1.6	Frequency: 50 Hz	
9.2.1.7	Frame Size & RPM: Compatible with the rig engines	
9.2.1.8	Insulation Class: H	
9.2.1.9	Enclosure: Alternator- IP 23 minimum; Terminal box- IP 23 minimum	
9.2.1.10	Voltage regulation: ±5% (As per IS 13364-2)	

9.2.1.11	Frequency regulation: ± 3% (As per IS 13364-2)	
9.2.1.12	Alternators shall be matched to the engines 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.	
9.2.1.13	Windings shall be VPI and dried	
9.2.1.14	Stator leads shall be terminated on suitably rated copper straps (standoff connectors) for connection to load side	
9.2.1.15	Plate /grommet /gland for main cable entry should be of nonmagnetic materials to avoid heating by generation of eddy currents, as single core power cable will be used for termination	
9.2.1.16	Insulation barrier should be provided to separate power and control terminals	
9.2.1.17	Two nos. eye bolts/ lifting lugs for lifting the machine should be provided on the main frame	
9.2.1.18	Cable glands shall be provided for safe and proper entry of all cables	
9.2.1.19	All the terminals shall be labelled properly	
9.2.1.20	Alternator shall be provided with RTDs	
9.2.1.21	The rating plate of the alternator shall be as per relevant IS/IEC standard.	
9.2.2	REPORT OF STANDARD TESTS FOR RIG 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.	
9.2.1.3	Capacity: Minimum 1700KVA and should match Rig engine capacity	
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”.	

SECTION – 3.2

INSTALLATION & COMMISSIONING AT BHEL HYDERABAD AND M/S OIL SITE

INSTALLATION & COMMISSIONING AT BHEL HYDERABAD AND AT M/S OIL SITE

1. The Scope of work for Installation & Commissioning of Equipment's (covered in MOU) and integration of third party equipment's in drilling control system while installation and commissioning of rig at BHEL Hyderabad and Commissioning support at M/S OIL drill site:

Sl No	Scope of work
1	Installation & Commissioning of equipment at BHEL Hyderabad as per **Table-A.** Material handling and other utilities like Crane, compressed air, electricity, welding machines and electrode, general tools and tackles, unskilled/semi-skilled work force etc. will be provided by BHEL.
2	Special tools and tackles which are required for installation & Commissioning shall be responsibility of supplier.
3	Supplier to provide commissioning support of the equipment at M/S OIL rig site as per **Table-A** up to spudding of well. In addition to this, Commissioning support shall also include operational support for a period of 45 days after spudding of 1st well for particular rig, in case of any operational issue arises. Supplier to provide replacement of any failed components of rig and its equipment during this period. The bidder shall also provide required supervisory support for the lowering of mast, dismantling of rig at 1st location and assembly of rig and rig up at 2nd location. **Semi-skilled work force will be provided by BHEL as per the requirement for commissioning support at site.**
4	Integration of equipment with drilling control system shall be responsibility of supplier. List of equipment which are to be integrated is as per **Table – B**
5	Supplier to quote for Installation and Commissioning charges at BHEL Hyderabad on Lump sum basis as per price bid format given in Section-5. BHEL shall provide BHEL Guest house facility along with food and local conveyance up to BHEL premises to Bidder's staff during Installation and Commissioning of Rigs at BHEL Hyderabad. No other/additional charges shall be payable.
6	Supplier to quote for Commissioning support charges at M/S OIL site on Lump sum basis as per price bid format given in Section-5. No other/additional charges shall be payable.
7	Supplier should deploy the required number of person(s), well conversant with installation, commissioning, integration of third party equipment's and rig operations. The personnel should be able to communicate in English language.
8	Supplier to depute their Service personnel / team at BHEL Hyderabad or M/S OIL site within 7 working days from the date of intimation by BHEL for the Installation and commissioning work.

TABLE-A : SCHEDULE OF INSTALLATION AND COMMISSIONING SUPPORT FOR 3000HP RIG

Sl no.	Equipment	Installation at BHEL	Commissioning at BHEL	Commissioning Support at OIL site
1	Draw-works	By BHEL	By Supplier	By Supplier
2	Top Drive	By BHEL	By Supplier	By Supplier
3	VFD House & Drives	By BHEL	By Supplier	By Supplier
4	Drillers Cabin & Drilling control system	By BHEL	By Supplier	By Supplier
5	Iron Rough Neck	By BHEL	By Supplier	By Supplier
6	Rig Instrumentation	By Supplier	By Supplier	By Supplier
7	CCTV & INTERCOM System	By Supplier	By Supplier	By Supplier
8	Hydraulic Catwalk	By BHEL	By Supplier	By Supplier
9	Vertical Pipe Racker	Integration into Driller's cabin controls by Bidder		
10	AC Mud Pump	By BHEL	By Supplier	By Supplier

Note: Bidder to work out Installation and Commissioning charges for BHEL Hyderabad and Commissioning support charges at M/S OIL rig site based on above scope of work.

TABLE – B : SCHEDULE OF EQUIPMENT FOR INTEGRATION WITH DRILLING CONTROL SYSTEM

Sl no.	Equipment to be integrated with drilling control system
1	Draw-works
2	Top Drive
3	VFD House & Drives
4	Drillers Cabin
5	Iron Rough Neck
6	Vertical Pipe Racker
7	Hydraulic Catworks system
8	AC Mud Pumps
9	Centralised HPU and controls
10	Hydraulic Cat Head
11	Hydraulic Power slips
12	Casing Running Tool
13	Rig Instrumentation
14	CCTV & INTERCOM System
15	Independent Rotary Drive system

SECTION – 3.3

TRAINING OF M/S OIL & BHEL PERSONNEL

Scope of Work for Training for M/S OIL personnel

The AC-VFD Rig shall be supplied with new generation equipment's. To ensure proper operation and maintenance of the rig and equipment's, training module shall be designed by the manufacturer and training imparted to M/S OIL personnel's. The training shall include but not limited to the following:

Training (Per Drilling Rig)				
1.1	The supplier shall arrange for comprehensive training program before dispatch of equipment (preferably immediately after the **pre-dispatch inspection by TPI 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			
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 facility/ Rig Package Integrator facility:** Operation (including simulator training), Maintenance, Troubleshooting & Working Principle. Rig personnel will undergo comprehensive training at OEM premises in four batches. Each batch shall consist of 15 rig personnel total 45 nos. (15 x 4 = 60 Nos.).		
		1.5.1.1	Duration	15 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	02 (Two)
		1.5.1.7	Rig Building Engineer & supervisor	03 (Three)
		1.5.1.8	Field Communication Engineer	01(One)
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	**Drilling/Rig Building Engineers**		
		1.6.1.1	Various controls & operation (including simulator training)	
		1.6.1.2	Rig Hydraulics, Mud pump, Rig Hydraulics, hydraulic cat walk and Mud system	
		1.6.1.3	Top Drive & controls	
		1.6.1.4	Draw-works, Iron Rough Neck, Hydraulic Catwalk	
		1.6.1.5	Casing Running Tool, Vertical Pipe Racker	
		1.6.1.6	Safety features familiarization	
		1.6.1.7	Rig Assembling & dismantling	
		1.6.1.8	Rig raising & lowering mechanism & engineering, Drilling load distribution in individual parts (structural engineering)	
	1.6.2	**Mechanical Maintenance** Engineers		
		1.6.2.1	Operation and advanced maintenance & trouble shooting (including simulator)	
		1.6.2.2	Mud Pump, control system, trouble shooting and remedies	

		1.6.3	**Instrumentation Engineers/Installation 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 Draw Works 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, 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	**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, TDS, HVAC, Drilling Motors,
			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 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)
	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			
	1.7	**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's like Hydraulic Catwalk, Iron Rough Neck, hydraulic power slips
		1.7.3	The BOP cart system,TDS shall also be covered in the training module
	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 who can overview the maintenance and breakdown of the supplied rig equipment. The training shall focus on various systems and inter linkages, 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
	1.9	**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**	
		1.10.1	Supplier shall educate the rig crew during the commissioning of the rig and equipment's and also provide on-site training for 5 days after commissioning of rig; on the operational aspects, maintenance and care and advanced instrumentation.

Table 1

Training Modules

Sl. No.	Training	Venue	No. of Days per batch	Persons / batch	No. of batch
1	Comprehensive training (including simulator training)	OEM facility	15 days	15	4
2	Rig operation and maintenance of equipment (Drilling, Rig building & Mechanical)	SMP/ OEM training facility in	05 days	6	2
3	Breakdown, advanced maintenance and troubleshooting (Drilling, Rig building & Mechanical)		05 days	6	2

4	Breakdown, advanced maintenance and troubleshooting (04 Elect / 02 Instt)	India	05 days	8	2
5	Calibration Training (4 Elect./ 2 Instt)		03 days	7	2
6	On-site training after commissioning	Rig site	05 days	Rig crew	5

SMP – supplier's manufacturing plant

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 rig package. The training charges will be considered for evaluation of the offers. However, OIL/BHEL 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 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/BHEL 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 BHEL's account.

SECTION – 3.4

SCOPE OF THIRD PARTY INSPECTION

Broad Scope of Third party Inspection

Bidder has 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.

I. M/s. Lloyds
II. M/s. Bureau Veritas
III. M/s. RITES
IV. M/s. I.R.S (IR Class)
V. M/s. DNV-GL
VI. M/s. Tuboscope Vetco
VII. M/s Oil Field Audit Services
VIII. M/s ABS
IX. M/s DNV MES India Private Limited
M/s OMCI Rig Technical & Support Services Pvt Ltd

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: BHEL or its Client M/S OIL
		1.1.3	Project Owner: Manufacturer / Supplier
	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 by bidder on behalf of BHEL, which will function to ensure that the stipulated requirement are complied.
		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 Manufacturer / Supplier of the Rig in consultation with BHEL 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 Manufacturer / Supplier until TPICA carries out witnessing and approve a certain activity done by the Manufacturer / Supplier 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 BHEL. Manufacturer/ Supplier and BHEL 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 manufacturer or company.
			1.2.3.5	**Random Inspection (RI):** An inspection where BHEL 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 Manufacturer / Supplier to request the BHEL'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 BHEL/M/S 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 / M/S OIL so that the equipment meets the specified technical requirements.	
		2.1.3	-----	
		2.1.4	------	

		2.1.5	--
		2.1.6	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.
3	**Quality Assurance Plan (QAP) / Inspection & Test Plan (ITP):**		
	3.1	BHEL/M/S 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 BHEL 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 equipment, if applicable. 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	Bidder shall hire TPICA agency for inspection of equipment on behalf of BHEL. BHEL may also depute its engineers in addition during inspection of equipment at supplier works.
		5.1.2	All equipment of rig shall be tested as per standard test procedure of manufacturer and equipment manufacturers (QAP) and as per relevant API codes.
		5.1.3	TPI 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 purchase order.
		5.1.4	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 manufacturer and BHEL/M/S OIL. The consolidated TPI report for all the equipment's supplied shall be
	5.2	**Detailed Scope of Work**	
		5.2.1	The inspection of equipment's shall be conducted at the manufacturer's premises by the TPI agency in accordance with approved Test & Inspection procedures and Quality Assurance Plan (QAP). BHEL/M/S OIL may also depute their own inspection team

		5.2.2.1	Quality Manual: A document setting out the Manufacturer's Quality Policies,
		5.2.2.2	Quality Control Plan / Inspection & Test Plan (ITP): A document specific to each item, detailing for each production / manufacturing
		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
		5.2.4	The bidder shall notify the readiness of equipment for testing & inspection at least 45 days in advance to BHEL. BHEL shall intimate to M/S OIL for deputing their TPICA for Table-1 equipment.
		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's at their premises.
		5.2.6	-----
		5.2.7	List of equipment for carrying out Third Party inspection (TPI)
			VFD house
			Driller's cabin
			Top Drive, Elevator links ,
			Draw-works
			Rig Instrumentation
			Iron rough neck
			Mud Pump
			Vertical Pipe Racker, Hydraulic Catwalk, Hydraulic Power Slip
			Motors 100HP & higher
			Intercom/Paging/PA system
			CCTV System
		5.2.8	The QAP submitted by the bidder shall be reviewed by BHEL in consultation with M/S OIL and the final scope for inspection by TPICA for various items shall be firmed up and communicated to the bidder.
		5.2.9	The bidder shall submit the Manufacturer data book which shall include the TPI report of all the equipment's provided to them by the Third party inspectors.

			5.2.11	**Implementation of ITP / QAP and flagging of issues by TPICA.**
			5.2.11.1	Inspection of equipment shall be carried out as per standard test procedures of rig / equipment manufacturing and as per requirements of applicable API
			5.2.11.2	TPICA shall be responsible to be physically present at the original equipment manufacturer location in order to fully implement the ITP/QAP requirements.
			5.2.11.3	TPICA shall be responsible to flag issues and deviations if any and immediately inform to OIL.
			5.2.11.4	--

			5.2.11.5	The functional tests of rig equipment's shall be performed, to be witnessed by TPICA in accordance with the QAP.
		5.2.12	**TPICA scope of work on the project is to provide an independent third party inspection services covering the following aspects:**	
			5.2.12.1	Material Inspection and traceability.
			5.2.12.2	Mechanical testing and hardness testing witness.
			5.2.12.3	Chemical analysis review.
			5.2.12.4	Heat treatment: Quenching and tempering witness/ review.
			5.2.12.5	Ultrasonic thickness gauging.
			5.2.12.6	Welding and NDT inspection.
			5.2.12.7	Visual inspection.
			5.2.12.8	Final product: Dimensional inspection check.
			5.2.12.9	Functional testing as applicable.
			5.2.12.10	Pressure test as applicable.
			5.2.12.11	Leak test as applicable.
			5.2.12.12	Blasting and Painting inspection.
			5.2.12.13	Manufacturer quality dossier review.
			5.2.12.14	Pre-shipment inspection.
		5.2.13	**Pre-dispatch inspection and submission of report**	
			5.2.13.1	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.
			5.2.13.2	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.
			5.2.13.3	All relevant documentation shall be provided by the manufacturer to TPICA for review including but not limited to equipment certifications, manuals, QC documentations etc.
			5.2.13.4	TPICA to ensure that all drawings, manuals are in English language.
			5.2.13.5	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 BHEL/OIL for appraisal and acceptance after carrying out the stage inspection.

			5.2.13.6	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.
			5.2.13.7	--

SECTION – 3.5

ADDITIONAL NOTES

Additional Notes : Bidder to NOTE & Confirm

1. All major items shall be mounted on heavy duty self-loading skid used in oilfields.

2. Equipment manufacturer shall decide about appropriate number of channels in the skid to be provided for proper equipment stability during operations and transportation.

3. OVERALL DIMENSION OF INDIVIDUAL ITEM HAVING SKID should not preferably exceed (including skid) 10.5 meter × 2.50 meter × 3.2 meter (L x W x H).

4. A) For Major items (exception items) viz., VFD House, Draw Works, Catwalk, Mud Pump & Top Drive, the limiting dimensions (after dismantling, if any) shall be as follows: [Bidder to Confirm]

S.No.	Details of the item	Limiting Transport Length (mm)	Limiting Transport width (mm)	Limiting Transport Height (mm)	Limiting Transport Weight (kg)
1	PCR	12250	3000	3200	35000
2	Catwalk	12000	3000	3200	24000
3	Drawworks	8000	3000	3200	35000
4	Top Drive	8000	3000	3200	22000
5	Mud pump	8000	3000	3200	40000

The bidder shall provide the transport dimensions & weight for exceptional items [after dismantling (if any) in the offer.

B) For Special items if any proposed by the Bidder, the limiting dimensions (after dismantling, if any) shall be filled in the below format and submit along with technical bid. However, Bidder shall ensure that the weight of the Special items (after dismantling, if any) shall be less than 35,000kg.

S.No.	Details of the item	Details of Disassembly required prior to transportation (if any)	Actual Transport Length (mm)	Actual Transport width (mm)	Actual Transport Height (mm)	Actual Transport Weight (kg)
1						
2						
3						
4						
5						

*Note: Bidder may add additional rows as per requirement.

5. Bidder to provide technical drawings for all major items as well as exceptional items (if any), along with the technical bid, clearly indicating the following:

a. Overall Dimensions and weight of the item
b. Components to be disassembled for transportation.

c. Final Transport Weight & Transport dimensions after the recommended disassembly.
d. Lifting lugs & lifting arrangement

6. **Suitable lifting lugs should be provided for each individual item**. 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. In case bottom lifting arrangement is required in equipment, all equipment skid shall have provision for lifting with lifting beam / bracket and shackles so that the same can be lifted from the Top without touching the enclosure/equipment or as specified in respective equipment technical specification for lifting details. (Lifting beams shall be in scope of BHEL, however bidder to provide lifting drawings for individual equipment to BHEL for design of Lifting beams).

7. Bidder to provide the Standard Operating Procedure (SOP) for handling & transportation of rig package components (for ex. Lifting , placement & transportation of Power Control room (PCR), Draw works, Top Drive System, etc.) including the list of Logistics resources (like Cranes etc.) required for Rig up, Rig down and Inter Location Movement (ILM) of the offered rig within 01 (one) month of finalization of component drawing/rig layout

8. PAINTING INSTRUCTIONS (as applicable) :

At least 3 coats of EPOXY PAINT after applying primer. Under Coating with Anti Corrosive Treatment for cement & rust and polyurethane paint. The preferred colour shade should be as under.

1. MUD PUMPS - BLUE
2. MUD PUMP SKID - GREY
3. DRAW-WORKS - BLUE
4. VFD CONTROL ROOM – White
5. DRILLERS CABIN - as per OEM's own colour code

*All operating and warning labels on equipment should be in English.
**M/S OIL logo plate shall be provided/riveted on Driller's cabin (Back and catwalk side).

9. TEST CERTIFICATE

All equipment's are to be tested as per relevant API standard/ Factory acceptable test. Supplier has to provide all test certificates along with the delivery of equipment. 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 equipment.

10. SPARE PARTS:

Mandatory spares and Commissioning spares of all supplied equipment / system should be included in the offer indicating item, part no. & quantity required. Item wise price of such spares should also be provided in commercial bid. Price of above mentioned spares shall be considered for bid evaluation.

Bidder shall quote Recommended Spares for four years' normal operation of all supplied equipment / system indicating item, part no. & quantity required along with price of each item. The price of such spares shall not be revised for next four (04) years from the date of commissioning and BHEL can place orders at any time during this period on receipt of order from M/s OIL. **Cost of four years' operational spares shall not be considered for bid evaluation.**

Bidder shall provide technical specifications for general items like Service Hoses, Metallic Tubing, Hose Fittings, Belts, Bearings, pipe fittings etc. if order is awarded to him.

11. PARTS CATALOGUE, OPERATION / INSTRUCTION MANUAL & DRAWING.

The 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.

The supplier should provide the following information wherever applicable along with the technical offer:

- Dynamic load
- Static load
- Unbalance load
- Location of centre of gravity.

The catalogue should include

- Weight of each & every major equipment / component such as draw-works, Top drive 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

12. MANUALS & CATALOGUES

Supply of 4 (Four) 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 Draw-works, Top Drives, mud system & solid control Equipment, electrical system, etc. including it's sub-assemblies complete with all schematics along with the unit.

In addition, supply of 4 (Four) sets catalogue/manual in USB Drive. All manuals & catalogues should be in English.

SECTION – 3.6

PREFERRED VENDOR LIST
(Extracted from M/S OIL Tender)

Preferred Vendor list as applicable for rig equipment covered in this tender.

a) Make of critical rig accessories for supply with rig package should be as per the undernoted preferred options:

Sl	Equipment/Item	Company preferred by M/S OIL
1	1.MAST & SUB-STRUCTURE 2.CROWN BLOCK 3. DRAW WORKS 4. TOP DRIVE 5. DRILLING CONTROL SYSTEM	OEM
2	TRAVELLING BLOCK & HOOK	1. OEM of the Rig 2. NOV 3. BENTEC 4. AMERICAN BLOCK 5. CAMERON
3	HYDRAULIC CATWALK	1. OEM of the Rig 2. NOV 3. BENTEC 4. CANRIG 5. DRILLMEC
4	DEADLINE ANCHOR	1. NOV 2. BENTEC 3. AMERICAN BLOCK 4. HERCULES 5. CAMERON
5	CASING RUN IN TOOL	1. NOV2. CANRIG3. TESCO4 WEATHERFORD
	JET SHEARING DEVICE	1. OEM of the Rig 2. MI SWACO 3. ELGIN
7	BOP HANDLING SYSTEM	1.INGERSOLL RAND 2.SCHLUMBERGER 3.JDN NEUHANS 4.RAM
8	ROTARY TABLE	1. OEM OF THE RIG 2. AMERICAN BLOCK COMPANY 3. DRILLMEC S.P.A. 4. CAMERON 5. NATIONAL OILWELL VARCO
9	MASTERBUSHING / ROTARYSLIP (HYDRAULIC)	1. NATIONAL OILWELL VARCO 2. FORUM BLOHM+VOSS OI

		LTOOLS GMBH/BVOT, GERMANY 3. FORUM ENERGY TECHNOLOGIES 4. Den-ConToolCompany Ltd.
10	HYDRAULIC CATHEAD	1. 1. NATIONAL OILWELL VARCO 2. BENTEC 3. DRILLMEC
11	DISC BRAKE(AUXILIARY) OF DRAW-WORKS BRAKE	1. EATON CORPORATION 2. NATIONAL OILWELL VARCO 3. WICHITA CLUTCH, USA
12	LINEAR MOTION SHALE SHAKERS, LINEAR MOTION MUD CLEANER VACUUM DEGASSER,	1. DERRICK EQUIPMENT CO., USA 2. NATIONAL OILWELL VARCO 3. MI SWACO
13	PNEUMATIC WINCHES	1. INGERSOLL RAND2. BRADEN,USA3. EMCE
14	AIR COMPRESSOR	1 SULLAIR, USA 2. INGERSOLL RAND INTERNATIONAL 3. ELGI, INDIA 4. CHICAGO PNEUMATIC 5. KAESERKOMPRESSOREN, GERMANY 6. ATLASCOPCO
15	POWER PACK ENGINE	CATERPILLAR
16	ELEVATOR LINK	1. NOV 2. FORUM ENERGY TECHNOLOGY, 3.TEXAS INTERNATIONAL
17	MUD PUMP	1. GARDNER DENVER 2. NATIONAL OILWELL VARCO 3. MHWIRTH, GERMANY 4. DRILLMEC 5. RIG OEM OWN MAKE
18	HIGH PRESSURE MUD HOSE	1. GATES CORPORATION /IOLA FACILITY 2. CONTITECH RUBBER INDUSTRIAL LTD. 3. DUNLOP ARGENTINA S.A.
19	IRON ROUGHNECK	1. National Oilwell Varco 2. BENTEC 3. FORUM 4. DRILLMEC 5. CANRIG
20	POWER SLIPS (HYDRAULICS)	1. NATIONAL OILWELL VARCO 2. BLOHM+VOSS OIL TOOLS

		GMBH 3. FORUM ENERGY TECHNOLOGIES 4. DEN-CONTOOLCOMPANY LTD., USA
21	CASING / DRILLING LINE	1. BRIDON AMERICAN CORP. 2. USHA MARTIN LIMITED. 3. WIRE ROPE CORPORATION OF AMERICA INC.
22	ROTARY HOSE	1. DUNLOP ARGENTINA2. CONTINENTAL3. GATES CORPORATION
23	RIG WALKING SYSTEM	. OEM OF THE RIG 2. CANRIG 3. SCHLUMBERGER

Item to be supplied from above preferred vendors OR alternately in compliance to evaluation creation as per Clause 6 of Section-1.

b) Make of General Rig Accessories for supply with rig package should be as per the undernoted preferred options:

Sl	Equipment/Item	Company preferred by M/S OIL
1	500-KVA, AUX. DGSET	1. CATERPILLAR 2. CUMMINS 3. JACKSON, INDIA 4. SUDHIR POWER LTD, INDIA 5. POWERICA LTD, INDIA 6. KIRLOSKAR (KOEL) 7. GREAVES LTD. 8. MAHINDRA POWEROL
2	HIGH PRESSURE MUD HOSE (ROTARY AND VIBRATORY)	1. GATES CORPORATION /IOLA FACILITY 2. CONTITECH RUBBER INDUSTRIAL LTD. 3. DUNLOP ARGENTINA S.A.
3	HIGH PRESSURE GAUGES	1. CAMERON INSTRUMENTS, CANADA 2. NATIONAL OILWELL VARCO 3. OTECOINC, USA 4. WAGNER INSTRUMENTS, USA
4	CENTRIFUGAL PUMPS (FOR USAGE AS DESANDER, DESILTER,	1. NATIONAL OILWELL VARCO 2. ADROIT, INDIA 3. KHALSA, INDIA

	DEGASSER, SUPERCHARGER, MUD MIXING PUMPS)	4. HARRISBURG 5. SPD BAKER 6. MUD HOG 7. TENGLE MISSION 8. GRW, INDIA 9. KIRLOSKAR, INDIA 10. JEE PUMPS PVT LTD, INDIA
5	HP VALVES	1. OTECO INC., USA2. AUDCO (L&T VALVES), INDIA3. WOM, INDIA4. DEMCO (CAMERON), USAWEATHERFORD
6	RIG ALTERNATORS	1. KATO (NIDEC) 2. BHEL 3. CATERPILLAR (CAT) 4. GENERAL ELECTRIC
7	AC VFD DRILLING MOTORS (EXCEPT TOP DRIVE)	1.GENERAL ELECTRIC (WABTEC) 2.ABB 3.BENTEC 4.NOV 5. RIG OEM OWN MAKE RAM
8	VFD SYSTEM	1. ABB 2. SIEMENS 3. RIG OEM OWN MAKE
9	ADVANCED INSTRUMENTATION SYSTEM & SENSORS	1. NATIONAL OILWELL VARCO

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SECTION – 3.7

DRAWINGS AND DOCUMENT SUBMISSION SCHEDULE

3.7 DRAWINGS AND DOCUMENT SUBMISSION SCHEDULE :

3.7.1 DRAWINGS AND DOCUMENTS TO BE SUBMITTED WITH PART-2 BID :

Following drawings and documents are requested from bidders to be submitted along with the Part-2 (Technical offer) for evaluation of the bids :

i) Detailed technical specifications, manufacturer's specification sheets, literature, drawings, layout drawings & catalogues, Outline general arrangement drawings indicating overall dimensions of the equipment offered for following major equipment: -
- AC Draw works
- AC Top Drive & CRT
- VFD House (PCRs)
- Driller Cabin
- Rig instrumentation
- AC Mud pumps
- Iron Rough Neck
- Hydraulic Catwalk system
- Power Slip
- AC Motor for IRD system etc

ii) Technical leaflet / catalogs of the offered equipment.

iii) Technical details of the Mud Pump, other accessories with dimensional drawings to be submitted along with the technical offer.

iv) The bidder should provide the following information wherever applicable along with the technical offer:
- Dynamic load
- Static load
- Unbalance load
- Location of centre of gravity.

v) Bidder should submit following additional information along with the offer :
- Weight of each & every major equipment / component
- All principal dimensions of Major components
- Rig-up & rig-down sequence.

3.7.2 DRAWINGS AND DOCUMENTS TO BE SUBMITTED AFTER PO FOR APPROVAL :

Following drawings and documents are to be submitted by bidders after placement of PO for approval by BHEL as per agreed timelines:

i) Outline general arrangement drawings indicating overall dimensions of Mud Pump, Mast & substructure

ii) Any other drawing / document necessary for approval by BHEL/M/S OIL.

iii) Supplied standard FAT procedures for various equipment offered

iv) Quality plan to be submitted for approval by BHEL

SECTION – 3.8

LIST OF SPARES

SECTION-3.8.A: *MANDATORY SPARES* FOR SUPPLIED EQUIPMENT

Bidder to quote for Mandatory spares as per Appendix 3.8A (**to be considered for evaluation**)
List of Mandatory Spares

MANDATORY SPARES

Bidder(s) must quote for all the mandatory spares 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 as per the quantity mentioned in this Section / Appendix. Mandatory spares listed hereunder are minimum requirement of OIL.

However, bidder on their own should also quote for additional mandatory spares, 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 listed hereunder. The successful bidder will have to supply all such additional mandatory spares along with Rig.

INSTRUMENTATION:

Sl. No.	Corresponding Section/ Clause	Description of Spare	Part No. if any	Quantity required	UOM	Bidders Remarks: (Confirmed/Not Confirmed/Deviation) Additionally, bidder to provide brief details including make, model, key specification parameters etc., of their offered equipment/items and additional remarks, if any.
1	10.10.2. [A].(a)	Data Acquisition System Controller with base, Power Supply Module & Input / Output Module		01	Set	
2	10.10.2. [A].(b)	Driller's cabin HMI for Data Acquisition System		01	No.	
3	10.10.2. [A].(c)	Weight Indicator Sensor		01	No.	
4	10.10.2. [A].(d)	Mud Volume Sensor		02	No.	
5	10.10.2. [A].(e)	Return Flow Sensor		01	No.	
6	10.10.2. [A].(f)	SPM sensor for pumps		02	No.	
7	10.10.2. [A].(g)	Pressure transducers (1k, 5k &		01 no. of each type	No.	
8	10.10.2. [A].(h)	Mud Density Sensor		01	No.	

9	10.10.2. [A].(i)	Mud Temperature Sensor		01	No.	
10	10.10.2. [A].(j)	Electronic sensor/Encoder		01	No.	
11	10.10.2. [A].(k)	RPM sensor (Note: 01 no. of each type to be supplied if RPM sensor for Top Drive & Rotary Drive are different)		01	No.	
12	10.10.2. [A].(l)	Torque sensor (Note: 01 no. of each type to be supplied if Torque sensor for Top Drive & Rotary Drive are different)		01	No.	
13	10.10.2. [A].(m)	Mud Conductivity Sensor		01	No.	
14	10.10.2. [B].(a)	Gas Detector-LEL		01	No.	
15	10.10.2. [B].(b)	Gas Detector-H2S		01	No.	
16	10.10.2. [B].(c)	Sensor for Gas Detector- LEL		01	No.	
17	10.10.2. [B].(d)	Sensor for Gas Detector- H2S		01	No.	
18	10.10.2.[B].(e)	All PCB cards/modules of Gas Monitoring controller cum display unit		01	Set	
19	10.10.2.[B].(f)	Weatherproof		01	No.	
20	10.10.2.[C].(a)	PTZ camera		01	No.	
21	10.10.2.[C].(b)	Bullet Fixed Camera		01	No.	
22	10.10.2.[C].(c)	Cables used for Camera system		100	Meter	
23	10.10.2.[C].(d)	Cable Glands		10	Nos.	
24	10.10.2.[C].(e)	Connectors (Male and Female)		10	Sets	
25	10.10.2.[C].(f)	CCTV system controller		01	No.	
26	10.10.2.[C].(g)	CCTV display		01	No.	
27	10.10.2.[E].(a)	Spares for monitoring and control of		01	Set	

		Drawworks (Control Module & each type of I/O Module, sensor & electrical solenoid valve)				
28	10.10.2.[E].(b)	Spares for monitoring and control of Top Drive (Control Module & each type of I/O Module, sensor & electrical solenoid valve)		01	Set	
29	10.10.2.[E].(c)	Spares for monitoring and control of Hydraulic Cathead(Control Module & each type of I/O Module, sensor & electrical solenoid valve)		01	Set	
30	10.10.2.[E].(d)	Spares for monitoring and control of Iron Roughneck (Control Module & each type of I/O Module, sensor & electrical solenoid valve)		01	Set	
31	10.10.2.[E].(e)	All joysticks along with control cards in driller's cabin		01	Set	
32	10.10.2.[E].(f)	Spares for monitoring and control of Vertical Pipe Handling System (Control Module & each type of I/O Module, sensor & electrical solenoid valve)		1	Set	
32	10.10.2.[E].(g)	Spares for monitoring and control of Hydraulic Catwalk (Control Module &		1	Set	

		each type of I/O Module, sensor & electrical solenoid valve)				

ELECTRICAL:

Sl. No.	Corresponding Section/ Clause	Description of Spare	Part No,if any	Quantity required	UOM	Bidders Remarks: (Confirmed/Not Confirmed/Deviation) Additionally, bidder to provide brief details including make, model, key specification parameters etc., of their offered equipment/items and additional remarks, if any.
1	9.10.5.1.1	a. DWS Motor (spare)- Main Drilling Motor		1	No.	
		b. MP Motor (spare)-Main Drilling Motor		1	No.	
		c. RT Motor (spare)-Main Drilling Motor		1	No.	
2	9.10.5.1.2	a. Blower unit (for drilling motors-DWS)-AC motors		1	No.	
		b. Blower unit (for drilling motors-MP)-AC motors		1	No.	
		c. Blower unit (for drilling motors-RT)-AC motors		1	No.	
3	9.10.5.1.3	Soft starter unit-PCR starter panel		1	No.	
4	9.10.5.1.4	Air Conditioner, Ex type for Driller's Cabin		1	No.	
5	Deleted					
6	Deleted					
7	Deleted					
8	9.10.5.1.8	Lube oil motors (if		1	No.	

		used) for Mud Pump / Draw Works/RT				
9	Deleted					
10	9.10.5.1.10	Blower motor assembly for resistor bank (Dynamic brake)		1	No.	
11	9.10.5.1.11	VFD Converter/Rectifier module (for VFD Rectifier panel)		2	No.	
12	9.10.5.1.12	a. VFD Inverter module (for DWS VFD panels)		1	No.	
		b. VFD Inverter module (for MP VFD panels)		1	No.	
		c. VFD Inverter module (for RT VFD panels)		1	No.	
		d. VFD Inverter module (for TDS VFD panels)		1	No.	
13	Deleted					
14	Deleted					
15	9.10.5.1.15	Power trans former (600/415 VAC)-Spare		1	No.	
16	9.10.5.1.16	PLC/ SBC/PAC system spares (complete set containing-PLC CPU, IOs, PS, IM etc.)		1	Set	
17	9.10.5.1.17	Air Conditioner for PCRs (one no. of each type/rating HVAC)		1 (of each type /rating)	No.	
18	9.10.5.1.18	Special maintenance tools for the drilling motors (as recommended by motor OEM)		1	Set	

19	9.10.5.1.19	Top Drive AC VFD Motor- Main motor		1	No.	
20	9.10.5.1.20	Top Drive Blower Motor		1	No.	
21	9.10.5.1.21	a. Top Drive Hydraulic Motor b. Top Drive Hydraulic heat exchanger fan motor		1 1	No. No.	
22	Deleted					
23	Deleted					
24	Deleted					
25	Deleted					
26	9.10.5.2.5	Control fuses of each type / rating (for PCR, Drillers cabin, MP console etc.)		10 (of each type / rating)	No.	
27	9.10.5.2.6	Fuse holder set of each type (base and carrier) (for PCR, Drillers cabin, MP console etc.)		02 (of each type / rating)	No.	
28	9.10.5.2.7	Control switches of each type (for PCR, Drillers cabin, MP console etc.)		01 (of each type)	Set	
29	9.10.5.2.8	Indicating meters of each type (for PCR, Drillers cabin, MP console etc.)		01 (of each type)	Set	
30	9.10.5.2.9	Control pots of each type (for PCR, Drillers cabin, MP console etc.)		01 (of each type)	Set	
31	9.10.5.2.10	Control relays of each type (for PCR, Drillers cabin, MP console etc.)		02 (of each type)	Set	

32	9.10.5.2.11	Contactors of each type (for PCR, Drillers cabin, MP console etc.)		02 (of each type)	Set	
33	9.10.5.2.12	a. Diodes for VFD Convereter/rectifier module (each set containing 6 nos. diodes for complete bridge)		02	Set	
		b. IGBT for VFD module (each set containing 6 nos. IGBTs for complete bridge)		02	Set	
34	9.10.5.2.13	Power fuse and control fuse for diodes (rectifier section) of each type/rating		02 (of each type /rating)	Set	
35	9.10.5.2.14	Brake Chopper unit for DC Bus for Dynamic Braking (if applicable)		02	No.	
36	9.10.5.2.15	Critical spare for VFD rectifier unit (PCB, controller of each type used in VFD rectifier panels, HMI)		04 (PCB, controller of each type used)	Set	
37	9.10.5.2.16	Critical spare for Inverter/ VFD unit module (PCB, controller of each type used in VFD Inverter panels, HMI)		06 (PCB, controller of each type used)	Set	
38	9.10.5.2.17	Power and control		06	No.	

		fuse for VFD inverter unit of each type/rating				
39	9.10.5.2.18	a. Air circuit breaker/MCCB of each type for PCR–Generator panels		01 (of each type /rating)	No.	
		b. Air circuit breaker/MCCB of each type for PCR–Rectifier panels		01(of each type /rating)	No.	
		c.Air circuit breaker/MCCB of		01 (of each type /rating)	No.	
		type for PCR–Transformer panels				
		d. ACB/ Isolator/DC SFU of each type for PCR– Inverter panels (as applicable)		01 (of each type /rating)	No.	
40	9.10.5.2.19	Control / relay module for air circuit breaker of each type for PCR-generator, rectifier, inverter, transformer panels		01	No.	
41	9.10.5.2.20	Generator Panel spares (PCB of each type, Fuse of each type)		02	Set	
42	9.10.5.2.21	Generator control module for Generator panel		02	No.	
43	9.10.5.2.22	PCB of each type for MPcon, D'con, Ground fault, synchronizing panel, NGR system		02	Set	
44	9.10.5.2.23	Control/ regulating transformer of each type PCR-Generator, rectifier, inverter, MPcon, D'con,		01	No.	

		Ground fault circuit etc.				
45	9.10.5.2.24	MCCB for AC motor starters of each Type PCR starter, feeder Panels		03(of each type /rating)	No.	
46	9.10.5.2.25	Contactors for AC motors of each Type PCR starter, feeder Panels		03(of each type /rating)	No.	
47	9.10.5.2.26	Overload relays of each type PCR starter, feeder Panels		05(of each type /rating)	No.	
48	9.10.5.2.27	RCD/RCBO of each type PCR starter, feeder Panels		03(of each type /rating)	No.	
49	9.10.5.2.28	Indication lamps of each type and colour PCR, D'con, MPcon etc.		10	No.	
50	9.10.5.2.29	HMI screen for generator panel		02	No.	
51	9.10.5.2.30	HMI screen for monitoring (with PLC HMI program)		01	No.	
52	9.10.5.2.31	Selector switch of each type Generator panel, MP console, D'Con, Drillers cabin etc.		10	No.	
53	9.10.5.2.32	Components of synchronizing system (Controller, synchronizing lamps, synchroscope, synch. Switch etc.)		01	Set	
54	9.10.5.2.33	Electrical components of drillers cabin (PCB		02	Set	

		of each type, Switch of each type, Joystick, potentiometer etc)				
55	Deleted					
56	Deleted					
57	Deleted					
58	9.10.5.2.37	Plug and receptacle set of each type & ratings (used in PCR, Cable extender house, Z-tray, D'con, MPcon, Derrick Floor, socket board of 500KVA (minimum) genset and isolation & lighting transformer hut)		12 (of each type & ratings) Also refer to Clause no. 9.5.3.15.9	Set	
59	9.10.5.2.38	PBS unit for AC motors		05	No.	
60	9.10.5.2.39	Emergency lamp for PCR		02	No.	
61	9.10.5.2.40	PCR anti panic lock set for PCR Doors		02	No.	
62	Deleted					
63	Deleted					
64	Deleted					
65	Deleted					

RIG BUILDING :

Sl no	Corresponding Section/ Clause	Description of Spare	Part No, if any	Quantity required	UOM	Bidders Remarks: (Confirmed/Not Confirmed/Deviation) Additionally, bidder to provide brief details including make, model, key specification parameters etc., of their offered equipment/items and additional remarks, if any.

1	1.10.2	5" / 4" x 7500 psi gooseneck hammer union		01	set	
2	2.1.11.1	TDS Wash pipe assembly with repair kit		02	Set	
3		TDS saver sub (NC50-Lower connection)		01	No.	
4		Hydraulic oil filter		02	No.	
5		Gear oil filter		02	No.	
6		Upper & Lower IBOP assembly with repair kit		02	each	
7	2.3	Lube oil filter		02	Set	
8		Gear Oil Filter		02	Set	
9		Kick back roller,		02	Set	
~~10~~		~~Casing line spooler~~ Deleted		~~02~~	~~Set~~	
11		Wear Plate kit		01	Set	
12		Reaction plate kit		01	Set	
13		Friction disc kit		01	Set	
14		Cylinder seal kit		01	Set	
15	2.5.6	Drive chain for IRD		02	No.	
16	3.1.11	Dies		02	Set	
17		Special Grease/lubricant		05	Kg	
18		Rollers		02	Set	
19		Hydraulic oil supply and return hose with fittings		01	set	
20	3.4.7	Spring assembly as spare per cathead.		02	Set	
21		Cathead cylinder seal		02	set	
22		Wire rope and wire rope assembly		02	set	
23		Hydraulic oil supply and return hose with fittings		01	set	

MECHANICAL (DRILLING TECHNICAL SERVICE):

SL NO	CORRESPON DING TENDER SECTION / CLAUSE	DESCRIPTION OF MANDATORY SPARE	PART NO, IF ANY	QUANTITY REQUIRED	UOM	Bidders Remarks: (Confirmed/Not Confirmed/Deviation) Additionally, bidder to provide brief details including make, model, key specification parameters etc., of their offered equipment/items and

						additional remarks, if any.
1	Deleted					
2						
3						
4						
5						
6						
7						
8	SECTION – 4:	4.5 SPARE FOR MUD PUMP	PART NO, IF ANY	QUANTITY REQUIRED PER RIG	UOM	
9	4.5.1	DELETED				
10	4.5.2	DELETED				
11	4.5.3	Liner (any one size) with liner gasket 7" /7¼"/7½"	-	84	NO	
12	4.5.4	Liner (any one size) with liner gasket 6" /6 ¼" /6½"	-	48	NO	
13	4.5.5	DELETED				
14	4.5.6	DELETED			NO	
15	4.5.7	Piston Assembly (any one size) 7" /7¼" /7½"	-	54		
16	4.5.8	Piston Assembly (any one size) 6"/6 ¼ "/6½"	-	36	NO	
17	4.5.9	Piston Rod complete with Clamp	-	6	NO	
18	4.5.10	Valve Seat	-	70	NO	
19	4.5.11	Valve assembly with polyurethane	-	150	NO	

		insert				
20	4.5.12	Valve insert (polyurethane)	-	250	NO	
21	4.5.13	Valve spring	-	100	NO	
22	4.5.14	Valve cover gasket	-	250	NO	
23	4.5.15	DELETED				
24	4.5.16	DELETED				
25	4.5.17	Liner gasket, (any one size) 7"/7¼" /7½ "	-	90	NO	
26	4.5.18	Liner gasket, (any one size) 6"/ 6 ¼ "/ 6½"	-	90	NO	
27	4.5.19	Wear plate gasket	-	24	NO	
28	4.5.20	Wear plate	-	24	NO	
29	4.5.22	Banded power belt ,left and right(if applicable)	-	4	SET	
30	4.5.23	Pulsation Damper repair Kit with Pressure Gauge (0-7500 psi)	-	3	NO	
31	4.5.24	Valve seat puller with Pump set	-	1	NO	
32	4.5.25	Lube Oil Pump Assembly with Love joy Coupling, if applicable	-	2	NO	
33	4.5.26	Flushing Pump Assembly with Love joy Coupling	-	2	NO	
34	4.5.27	Lube oil Filters	-	3	NO	
35	4.5.28	Ring Gasket for Suction, Discharge Manifold and Pulsation Dampener etc.	-	12	SET	
36	4.5.29	Stroke counter meter	-	2	NO	
37	4.5.30	Belt tension meter (analogue)(if	-	2	NO	

		applicable)				
38	4.5.31	3'' RRV(1500 psi – 7500 psi), Manual reset	-	3	NO	
39	4.5.32	Special Tools for fluid end & pulsation dampener maintenance	-	1	SET	
40	4.5.34	Pulsation Dampener Complete (rating 7500 psi) of Make-Mattco or equivalent , (same make & model asper offer).	-	3	NO	
41	4.5.35	Strainer Cross Piece (7500 psi rating)	-	1	NO	
42	4.5.36	Infrared thermometer	-	1	NO	
43	4.5.37	DELETED				
44	4.5.38	DELETED				
45	4.5.39	Piston Rubber (any one size) 7" /7¼" /7½"	-	108	NO	
46	4.5.40	Piston Rubber (any one size) 6"/6 ¼ "/6½"	-	108	NO	
47	4.5.41	Liner Bushing Puller and Wear Plate Puller (if applicable)	-	1	NO	
48	4.5.42	Charging Hose assembly (with fittings) for Nitrogen pre-charging in Pulsation dampener		1	NO	
49	4.5.43	Valve Cover	-	6	NO	
50	4.5.44	0-10000 PSI Pr. gauge, type D, 2" Female	-	3	NO	
51	4.5.45	3" gate valve, Max WP 7500 Psi,		3	NO	

52	4.5.46	Repairing Kit, 3 gate valve, Max WP 7500 Psi		9	SET	
53	4.5.47	Butterfly valve of each size used (12" / 10'' /8" / 6"/ 4" / 2" etc.)		9	NO	
54	4.5.48	Vibrator hose, API Grade- E, 3.1/2 inch ID		9	NO	
55	4.5.49	Liner Spray System		3	NO	
	Notes:	Sizes of Liner(s) shall be same as the offered Pistons, wherever applicable				

SECTION-3.8.B: COMMISSIONING SPARES

Bidder to quote for commissioning spares in the format given in Appendix 3.8C for each equipment (**to be considered for evaluation**)

It is the responsibility of the supplier to provide adequate commissioning spares and consumables required during commissioning.

SECTION-3.8.C: OPERATIONAL SPARES FOR FOUR YEARS

Bidder to quote for operational spares for four years in the format given in Appendix 3.8B for each equipment (**shall not be considered for evaluation**).

Spares for four years' normal operation of all equipment / system should be included in the offer indicating item, part no. & quantity required. Item wise price of such spares should also be provided in commercial bid. Bidder should indicate the part nos. against each item along with OEM's part no. if any.

Bidders must confirm

i. The price of such spares shall not be revised for next 5 years from the date of commissioning along with the availability of spares for next 10 years.
ii. 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.

SECTION – 3.9

ANNUAL MAINTENANCE CONTRACT

BROAD SCOPE OF AMC

Bidder should also confirm in their Part bid -1 that they will agree for an Annual Maintenance Contract (AMC) with BHEL for carrying out the job as indicated against scope of work on regular basis. The AMC also includes the supply of 4 years spares for smooth functioning of equipment. The charges for such AMC should be indicated in the commercial bid Part-3. The bidder should indicate the year-wise break-up of AMC charges for four years from the date of completion of warrantee period. **This will be considered in evaluation of the tenders**.

The terms of AMC have been detailed further in this section as per end customer requirements. To meet these requirements, bidder shall provide their service team comprising minimum 1 no. Mechanical engineer, 1 no. Electrical engineer, 2 nos. Instrumentation & control engineers. BHEL will provide semi- skilled work force to support bidder as required for AMC works at site.

YEAR	ITEM DETAILS FOR AMC	AMC COST
YEAR-1	TOP DRIVE SYSTEM (TDS)	
	CASING RUNNING TOOL	
	ELECTRICAL EQUIPMENTS	
	RIG INSTRUMENTATION	
	HYDRAULIC CATWALK	
YEAR-2	TOP DRIVE SYSTEM (TDS)	
	CASING RUNNING TOOL	
	ELECTRICAL EQUIPMENTS	
	RIG INSTRUMENTATION	
	HYDRAULIC CATWALK	
YEAR-3	TOP DRIVE SYSTEM (TDS)	
	CASING RUNNING TOOL	
	ELECTRICAL EQUIPMENTS	
	RIG INSTRUMENTATION	
	HYDRAULIC CATWALK	
YEAR-4	TOP DRIVE SYSTEM (TDS)	
	CASING RUNNING TOOL	
	ELECTRICAL EQUIPMENTS	
	RIG INSTRUMENTATION	
	HYDRAULIC CATWALK	

3.9.1 AMC-TOP DRIVE SYSTEM (TDS):

		Bidders Remarks: (Confirmed/Not Confirmed/Deviation) Additionally, bidder to provide brief details including make, model, key specification parameters etc., of their offered equipment/items and additional remarks, if any. Relevant File Location in the Bid to support the remarks/compliance. (File Name & Page no. to be mentioned)
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. The bidder should indicate the year-wise break-up of AMC charges for four years. This will be considered in evaluation of the tenders.	
11.9.1	AMC-TOP DRIVE SYSTEM (TDS):	
11.9.1.1	SCOPE OF WORK: AMC Service for comprehensive on-site maintenance of TDS of newly procured OIL's 3000 HP AC- VFD rig . This AMC service is to provide both scheduled (preventive fixed interval of time)	
	as well as unscheduled (emergency call for trouble shooting) services to cut down equipment down- time , to provide an optimum performance and to extend the life of the equipment. The AMC also includes supply of spares for smooth maintenance services. Scope of work extend which includes but not limited to the following: a) Services shall be provided during rig-up & rig-down of TDS.. & inter location movement. b) Services for maintenance, troubles hooting & providing support services during course of a well for keeping the complete TDS packages in excellent operational condition. c) Familiarizing the rig crew with the complete equipments/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/equipments 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 include spares for four years AMC 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. Bidder should indicate the part nos. against each item along with OEM's part no. if any. The cost of spares will be considered for price comparison. The price of such spares shall not be revised for next 5 years from the date of quotation 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) Spares which are not available with OIL shall be provided by the service provider after taking prior approval from OIL for the Rate/terms and condition/ terms of delivery. The Service provider should maintain the critical spares at Duliajan during the period of the AMC which are not available with OIL to facilitate immediate replacement of damaged/defective equipment to ensure minimum downtime. OIL shall not be	

	bound to purchase any un-used spares from the contractor at any point in time. c) Replaced defective spares shall be deposited to Oil India Limited.	
11.9.1.3	SPECIAL TOOLS/CALIBRATORS: a) The Service Provider shall arrange 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 if required for carrying out the maintenance, repair, & 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 equipments of TDS	Once, at the start of the contract.
2	Maintenance Activity	Quarterly, Half-yearly, Yearly.
3	Equipment Test/Calibration/Breakdown reports	Whenever equipment /Spares etc. are repaired/ replaced with new ones.

4	Commissioning / Re-deployment report for all equipments 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	Technician
1	Rig Move (Rig-up & Rig-	1 No.	1 No.
2	Quarterly	2 Nos.	1 No.
3	Half-yearly	2 Nos.	1 No.
4	Yearly	2 Nos.	1 No.
5	Troubleshooting (On call basis)	1 NO (Mechanical or Electrical Instrumentation depending on the	As per requirement (To be decided depending on the nature of repair

a) Service Engineer (Mechanical)

i. Service Engineer – Mechanical : Should have a Degree preferably in Mechanical Engineering with a minimum of 3 years experience or Diploma in Mechanical Engineering with a minimum of 5 yrs. experience as Service Engineer in TDS maintenance & repair .

ii. Service Engineer – Electrical/ Instrumentation : Should have a Degree in Instrumentation/Electronics/ Electrical with a minimum of 3 years experience or Diploma in Instrumentation/Electronics /

	Electrical Engineering with a minimum of 5 yrs. experience as Service Engineer in TDS maintenance & repair . iii. Should have sound knowledge of TDS system& controls and have experience of carrying out maintenance of such systems. iv. 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. v. 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 / Electrical 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. d) 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. e) 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. f) 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) 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.	

3.9.2 AMC-HYDRAULIC CATWALK

11.9.2	AMC-HYDRAULIC CATWALK:	
11.9.2.1	SCOPE OF WORK: AMC Service for non-comprehensive on-site maintenance of Hydraulic Cat-walk & its Hydraulic control system of newly procured OIL's 3000 HP AC- VFD rig . This AMC service is to provide both scheduled (preventive,) assembly , disassembly as well as unscheduled (emergency call for trouble shooting) services to cut down equipment down-time , to provide an optimum performance and to extend the life of the equipment. The AMC also includes supply of spares for smooth maintenance services. Scope of work extend which includes but not limited to the following: a) Services shall be provided during assembly, dis-assembly unit with control system prior rig-up and after rig-down respectively. b) This AMC service is to provide preventive & schedule maintenance as well as for emergency trouble shooting services to cut down equipment down-time , to provide an optimum performance and to extend the life of the equipment. The AMC also includes supply of spares for smooth maintenance services. Scope of work extend which includes but not limited to the following: 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 Hydraulic Catwalk 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/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 persons shall be fully conversant with the complete Hydraulic Catwalk system & controls. They should be physically fit for working in the well site. They should also be able to work with 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 Hydraulic Catwalk. 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 include spares for four 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. Bidder should indicate the part nos. against each item along with OEM's part no. if any. The cost of spares will be considered for price comparison. The price of such spares shall not be revised for next 5 years from the date of commissioning 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)Spares which are not available with OIL shall be provided by the service provider after taking prior approval from OIL for the Rate/terms and condition/ terms of delivery. The Service provider should maintain the critical spares at Duliajan during the period of the AMC which are not available with OIL to facilitate immediate replacement of damaged/defective equipment to ensure minimum downtime. OIL shall not be bound to purchase any un-used spares from the contractor at any point in time.	
	c)Replaced defective spares shall be deposited to Oil India Limited.	
11.9.2.3	SPECIAL TOOLS/CALIBRATORS: a) The Service Provider shall arrange for all the tools & tackles and instruments for carrying out the maintenance & troubleshooting of the Hydraulic Catwalk& 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 if required for carrying out the maintenance, repair, & 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	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
1	PM Schedule for all equipments of Hydraulic Catwalk	Once, at the start of the contract.
2	Maintenance Activity	Quarterly, Half- Yearly, Yearly.
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 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 of repair work)	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/Electrical/Mechanical Engineering with a minimum of 5 yrs. experience in maintenance & repair of Hydraulic Cat-walk & Control system.

ii. Should have sound knowledge of Hydraulic Catwalk 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 Hydraulic Catwalk of (AC-VFD) drilling rigs.

iv. Should be conversant with Oil Mines Regulations and OISD.

c) 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 Hydraulic Catwalk or other Hydraulic equipment maintenance.

ii) Should have sound knowledge of Hydraulic Catwalk system& controls.

d) 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. e) 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. f) 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. d) Bio-data of the candidate with photograph.	
	e) Photo copy of relevant pass certificates and other proficiency certificate f) Copy of experience certificates (original to be produced on demand). iii) 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.	

3.9.3 AMC-CASING RUNNING TOOL

11.9.5	AMC-CASING RUNNING TOOL:	
11.9.5.1	SCOPE OF WORK:	
	AMC Service for comprehensive on-site maintenance of Casing run in Tool with its control system of newly procured OIL's 3000 HP AC-VFD rig . This AMC service is to provide Supervisory services in Tool Assembly, Dis-assembly & casing run in operation with Tool and Maintenance & trouble shooting for smooth operation, cut down equipment down-time , to provide an optimum performance and to extend the life of the equipment. Scope of work extend 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 Tool Assembly, Dis-assembly & casing run in operation. c) Shall also carry out necessary maintenance/servicing of the tools/equipment. During visit of Casing run –in operation. 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 thecomplete satisfaction of Oil India. i) The maintenance package shall include services of Service Engineer and the Service Team along with provision of all special tools, tackles, instruments. j) 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. k) The manpower & tools including OIL's own workshop facility, if required for carrying out the maintenance & trouble shooting, will be made availableby OIL. l) The Service Provider shall provide a detailed maintenance check list detailing OIL INDIA LTD's responsibility on periodic maintenance of the Casing Running Tool.	
	m) The personnel(s) of service provider should preferably be Indian	

	citizens and fully trained by service provider to carry out the AMC. n) Accommodation, food, boarding & lodging will NOT be provided by OIL and that is the service provider's scope.	
11.9.5.2	SPARES & CONSUMABLES: a) Bidder to include spares for four years of AMC 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. Bidder should indicate the part nos. against each item along with OEM's part no. if any. The cost of spares will be considered for price comparison. The price of such spares shall not be revised for next 5 years from the date of commissioning of the rig 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) Spares which are not available with OIL shall be provided by the service provider after taking prior approval from OIL for the Rate/terms and condition/ terms of delivery. The Service provider should maintainthe critical spares at Duliajan during the period of the AMC which are not available with OIL to facilitate immediate replacement of damaged/defective equipment to ensure minimum downtime. OIL shall not be bound to purchase any un-used spares from the contractor at any point in time. c) Replaced defective spares shall be deposited to Oil India Limited.	
11.9.5.3	SPECIAL TOOLS/CALIBRATORS: a) The Service Provider shall arrange for all the tools & tackles and instruments for carrying out the maintenance & troubleshooting of the 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.	
11.9.5.4	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.	

Sl. No	Description of Reports	Frequency of reporting

1	PM Schedule for all equipments of Casing running tool	Once, at the start of the contract.
2	Maintenance Activity	After each maintenance as per schedule.
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.

c) Reporting: The Service Provider shall provide the following reports to OIL, as per frequency indicated against each report / document:

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

11.9.5.5 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	Supervisory service – Assembly, Disassembly & Casing run in Tool operation	1 No.	
2	Maintenance & trouble shooting	1 No	

a) Service Engineer

i. Should have a Degree preferably in Instrumentation/Electrical/Mechanical Engineering with a minimum of 3 years experience or minimum Diploma preferably in Instrumentation/Electrical/Mechanical Engineering with a minimum of 5 yrs. Work experience as Service Engineer in operation ,repair & maintenance of casing run in tool .
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 Tool.
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) 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.	

3.9.4 AMC- Not in scope

3.9.5 AMC- Not in scope

3.9.6 AMC- ELECTRICAL EQUIPMENT - 3000 HP VFD RIG:

11.9.6	AMC- Electrical Equipment of 1 no. of 3000 HP VFD Rig:	
11.9.6.1	SCOPE OF WORK: The scope of work for AMC in broad sense shall be periodic as well as breakdown maintenance of all the Electrical system/equipment of 3000 HP VFD Rigs including the TOP Drive system (Refer to electrical part of 3.1.4, 3.1.5 & 3.1.8) 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	
11.9.6.2	RIG ELECTRICALS: 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 part/equipment). ~~iii) Rig alternators (Power Packs).~~ iv) Alternator control system (Generator control panel).	
	v) Transformers. vi) DC bus sections (DC Power Distribution). vii) Rectifier sections (VFD drive Rectifier)/ Diode Supply Units. viii) HMI and Operating Console of Driller's Cabin & PCR. ix) Electrical system of Hydraulic Control Station. x) All Auxiliary AC motors and their associated starter/feeder panels (LT Power utilization & Distribution). xi) Soft starter panels including the soft starters and associated contactors/relays. xii) Drilling motors (Mud Pump Motors, Draw Works Motors, IRD Motor, Auto Drill motors, Top drive motors and associated blower and lube motors). xiii) VFD / Inverter panels. xiv) 600 VAC Power Distribution. xv) Dynamic braking system including brake choppers and resistors. xvi) NGR System, including NGR Monitor, resistances, and panel devices. xvii) Socket Boards and connected switchgears. xviii) 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 include spares for four years of AMC 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. Bidder should indicate the part nos. against each item along with OEM's part no. if any. The cost of spares will be considered for price comparison. The price of such spares shall not be revised for next 5 years from the date of commissioning of the rig 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) Spares which are not available with OIL shall be provided by the service provider after taking prior approval from OIL for the Rate/terms and condition/ terms of delivery. The Service provider should maintain the critical spares at Duliajan during the period of the AMC which are not available	
	with OIL to facilitate immediate replacement of damaged/defective equipment to ensure minimum downtime. OIL shall not be bound to purchase any un-used spares from the contractor at any point in time. c)Replaced defective spares 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 equipments covered under Para "11.9.6.2 A SCOPE " above	Once, at the start of the contract.
2	Maintenance Activity	Quarterly, Half- yearly, Yearly.
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 report for all equipment under AMC	At the beginning of every new location to be drilled

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, 2023

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. Special Provisions:

This AMC shall also cover maintenance of systems/equipments newly added or replaced during operational or statutory requirements.

I. Personnel to be deployed:

1. SERVICE PROVIDER shall provide personnel for maintenance, trouble-shooting & 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	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	As per requirement (To be decided depending

4. ELECTRICAL ENGINEER:

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.ELECTRICAL TECHNICAN:

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) 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 three (3) years ON-SITE maintenance, troubleshooting and support service for the complete rig instrumentation and control systems of the supplied Rig.	

3.9.7 AMC-RIG INSTRUMENTATION:

11.9.7	AMC-RIG INSTRUMENTATION:	
11.9.7.1	SCOPE OF WORK: 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 equipments/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 thecomplete 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 trouble shooting 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.	
11.9.7.2	<u>SPARES & CONSUMABLES:</u> a) Bidder to include spares for four years of AMC 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. Bidder should indicate the part nos. against each item along with OEM's part no. if any. The cost of spares will be considered for price comparison. The price of such spares shall not be revised for next 5 years from the date of commissioning of rig 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) Spares which are not available with OIL shall be provided by the service provider after taking prior approval from OIL for the Rate/terms and condition/ terms of delivery. The Service provider should maintainthe critical spares at Duliajan during the period of the AMC which are not available with OIL to facilitate immediatereplacement of damaged/defective equipment to ensure minimum downtime. c) Replaced defective spares shall be deposited to Oil India Limited.	
11.9.7.3	SPECIAL TOOLS/CALIBRATORS: 1. 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. 2. 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.	
11.9.7.4	QUALITY OF SERVICE: 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. Service provider shall carry out the maintenance as per the Original manufacturer recommendation. 3. 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 "11.10.7.1 SCOPE OF WORK" above	Once, at the start of the contract,
2	Maintenance Activity	Quarterly, Half-yearly, Yearly
3	Drawing Changes or alterations changes made to circuits, equipment with approval from OEM.	As and when such occur
4	Equipment Test/Calibration/Breakdown reports	Whenever equipment /Spares etc. are repaired/ replaced with new ones.
	Commissioning / Re-	At the beginning

		5	deployment report for all equipment under AMC	of every new location to be drilled	

4. 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.

5. 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

11.9.7.5

MANPOWER:

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) 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.	

SECTION – 4

DELIVERY SCHEDULE OF EQUIPMENT

EQUIPMENT WISE MATERIAL DELIVERY SCHEDULE – FOB BASIS		
Sl.	**Item Description**	**Delivery**
1	Draw-works	Within 13 months from date of LOA/PO placement
2	Top Drive along with Elevator link & CRT	
3	VFD House & Drives	
4	Drillers Cabin & Drilling control system, CCTV System & Intercom	
5	Iron Rough Neck	
6	Hydraulic Catwalk system	
7	AC Mud Pump	
9	IRD AC motor	
10	Rig Instrumentation	
11	Power Slip	
12	Commissioning Spares	
13	Mandatory spares	

SECTION – 5

PRICE BID FORMATS

1. Price bid Format of 3000 HP Capacity Rig Equipment (Technical specification Section – 3.1)– Material portion

Sl. No.	Description	Qty. per rig (A)	Unit Ex-works Price in USD (B)	Total Ex-works Price in USD (C=A*B)	Unit Weight in Kgs	Packed unit Dimensions (LxWxH) in mm
M1	3000 HP AC Draw works with motors	1 set				
M2	750T AC Top drive system	1 set				
M3	Casing Running Tool (CRT)					
M4	AC VFD House with AC Drives & Control	1 set				
M5	Driller control Cabin with HMI, Joy stick & Drilling controls system and Intercom & CCTV system	1 set				
M6	Rig Instrumentation System	1 set				
M7	AC Mud Pump	3 sets				
M8	AC motor for IRD	1 no.				
M9	Iron roughneck	1 no.				
M10	Hydraulic Catwalk System	1 no.				
M11	Hydraulic Power Slip	1 no.				
M12	**Grand Total of (C) Ex-works Material Value (Sum of M1 to M11)**					
M13	Lump sum Pre-dispatch Inspection Charges of above equipment (Sl No M1 to M11) thru TPI					
M14	Lump sum Packing & FOB Charges of above equipment (Sl No M1 to M11)					
M15	**Total FOB value of complete Material up to nearest seaport (M15 = M12+M13+M14)**					
M16	Grand Total Z1 of Mandatory spares as per Section 3.8.A					
M17	Grand Total Z2 of Commissioning spares of equipment's as per Section 3.8.B					
M18	Lump sum Packing & FOB Charges of Spares (for M16 to M17)					
M19	**Total FOB Value of Spares up to nearest sea** port M19 = (M16+M17+M18)					
T1	**Grand total FOB Value of complete material including spares up to nearest sea port T1 = (M15 + M19)**	Total in USD (Figures) ……. Total in USD (Words) ……..				

Note :

- Bidder to provide break-up of item wise TPI charges for items separately in the bid.
- Bidder to provide break-up of item wise Packing and FOB charges for all items separately in the bid. Break up FOB charges for spares to be provided for each equipment package and not for individual spare item. FOB charges for mandatory spares to be provided as break-up.
- Bidder to provide list of quoted commissioning spares (equipment wise) along with quoted quantity and price break-up.

2. Price bid Format of 3000 HP Capacity Rig Equipment (Technical Specification Section – 3.2 & 3.3) – Service Charges

Sl. No.	Description	Qty. per rig (A)	Unit Rate in USD / INR (B)	Total Price in USD / INR (C=A*B)
S1	Lump sum installation and commissioning charges of Equipment (Sl No. M1-M10 above) at BHEL Hyderabad India (Including travelling charges up to BHEL Hyderabad). BHEL shall provide food & accommodation at BHEL Guest house at Hyderabad. No other charges shall be paid by BHEL on account of this. (Bidder scope of work shall be as per Section 3.2)	1		
S2	Lump sum commissioning support of Equipment (Sl No M1-M10 above) at M/S OIL rig site in India (Including charges for travelling, boarding, local travel, food etc). No other charges shall be paid by BHEL on account of this. (Bidder scope of work shall be as per Section 3.2)	1		
S3	Lump sum integration charges for equipment as specified in Table-B of Section 3.2.	1 set		
S4	Lump sum Training Charges for OIL/BHEL engineers at Bidders (OEM) training facility (Bidder scope of work shall be as per Section 3.3)	1 set		
S5	Lump sum Training Charges for OIL/BHEL engineers at SMP / OEM (Bidder) training facility in India (Bidder scope of work shall be as per Section 3.3)	1 set		
T2	Grand Total of service charges (T2=S1+S2+S3+S4+S5)	Total in USD/INR (Figures) …… Total in USD/INR (Words) …… ……....		

Note:
If any bidder appoints Indian agency for providing services for Installation, commissioning & Training in India of equipment supplied by bidder, then the quote for the service portion shall be in Indian currency and order for this will be placed in Indian currency on Indian Agency. Final responsibility of execution of project shall be with the prime bidder.

3. Price bid Format for 4 years AMC charges (Technical Specification Section – 3.9)

Sl. No.	Description	Qty. (A)	Unit Rate in USD (B)	Total Price in USD (C=A*B)
S6	Total cost of four (04) years non-comprehensive AMC (**without spares**)	1		
S7	Taxes, if any, on S6	1		
T3	**Grand Total 4 years AMC charges (without spares) T3=S6+S7**	Total in USD (Figures) …… Total in USD (Words) …… ……....		

4.	**GENERAL CONDITIONS FOR PRICE BID :**
4.1	Prices should be quoted on FIRM basis.
4.2	Mandatory spares to be quoted for each of the equipment and detailed break-up of item wise quantity & rates to be furnished along with the price bid.
4.3	4 years' operational spares for each of the equipment to be quoted and detailed break-up of item wise quantity & rates to be furnished along with the price bid. (Not considered for bid evaluation)
4.4	Four (04) years AMC spares as per section 3.9 to be quoted and detailed break-up of item wise quantity & rates to be furnished as per Appendix- 3.9 along with the price bid. (Not considered for bid evaluation)
4.5	Year-wise break-up of AMC charges (Section 3.9) for four (04) years to be submitted separately along with price bid (part-3 bid).
4.6	Commissioning spares for each of the equipment to be quoted and detailed break-up of item wise quantity & rates to be furnished along with the price bid
4.7	Un-priced list of mandatory spares, 4 years operation spares & Commissioning spares to be submitted with Technical offer (Part-2 bid).
4.8	Lowest bidder (L1) for the complete package cost to BHEL (Equipment + Services) shall be arrived in Indian rupees as under after applying all loading factors, duties & taxes, Exchange rate, freight & insurance etc as detailed in Section – 2, Clause 16 (Instruction to Bidders) : **"Complete package cost to BHEL = T1 + T2 + T3** T1=Total landed material cost at BHEL Hyderabad in Indian Rupees T2=Total Service Charges to BHEL in Indian rupees T3=Total 4 yrs AMC charges in Indian Rupees **Above is BHEL standard procedure for comparison of price bids.**

SECTION – 6

INTEGRITY PACT FORMAT

INTEGRITY PACT (IP)

(a) IP is a tool to ensure that activities and transactions between the company and its Bidders/Contractors are handled in a fair, transparent and corruption free manner. Following independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

Sl	IEM	Address	Email
1	Shri Arun Chandra Verma, IPS (Retd.)	Flat No. C -1204, C Tower, Amrapali, Platinum Complex, Sector 119, Noida (U.P.)	acverma1@gmail.com
2	Shri Virendra Bahadur Singh, IPS (Retd.)	H. No. B-5/64, Vineet Khand, Gomti Nagar, Lucknow - 226010	vbsinghips@gmail.com

(b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this pact would be a preliminary qualification.

(c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any compliant arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:

No routine correspondence shall be addressed to the IEM (phone/post/email) regarding the clarifications, time extensions or any other administrative queries, etc. on the tenders issued. All such clarification/issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below.

Details of contract person(s):

Sl.no	Name	Phone & Email
1	Shri Rajeev Kumar AGM/BHEL	Ph: +914023185290 Mo.:+919490746965 raj31@bhel.in
2	Shri Bapiraju B DGM/BHEL	Ph: +914023182811 Mo.:+919490760296 bapiraju@bhel.in

Annexure-1

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____

_____ (hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process , terminate the contract, if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.

4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above , the Bidder(s)/ Cotractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be-entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee , whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

Section 5 - Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.

6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.

6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

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

Section 8 -Independent External Monitor(s)

8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.

8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.

8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.

8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.

8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.

8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.

8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Prinicpal should be looked into by the CVO of the Principal.

8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.

8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.

8.13 The word `Monitor' would include both singular and plural.

Section 9 - Pact Duration

9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.

10.2 Changes and supplements as well as termination notices need to be made in writing.

10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.

10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.

10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, 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. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

For & On behalf of the Principal
(Office Seal)

For & On behalf of the Bidder/ Contractor
(Office Seal)

Place _____
Date _____

Witness:_____
(Name & Address) _____
_____

Witness:_____
(Name & Address) _____
_____

SECTION – 7

PERFORMANCE BANK GUARANTEE FORMAT

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of the Bharat Heavy Electricals Limited [1] (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____ through its Unit at……..(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) having its registered office at_____[2] hereinafter referred to as the 'Contractor/Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No……dated ……..[3] valued at Rs……[4] (Rupees ----------)/FC……(in words……..) for ……[5] (hereinafter called the 'Contract') and the Contractor having agreed to provide a Contract Performance Guarantee, equivalent to ……% (…. Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

we, ……, (hereinafter referred to as the Bank), having registered/Head office at ……. and inter alia a branch at …… being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer a maximum amount Rs ---------- (Rupees ----------) without any demur, immediately on a demand from the Employer, .

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____ _____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor/ Supplier in any suit or proceeding pending before any

Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the contractors/supplier shall have no claim against us for making such payment.

We the ……bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We …….. BANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Contractor/Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Contractor/Supplier and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Contractor/Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

This Guarantee shall remain in force upto and including…….. [6] and shall be extended from time to time for such period as may be desired by Employer.
This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor/Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the ……..[7]we shall be discharged from all liabilities under this guarantee thereafter.

We, …… BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

a) The liability of the Bank under this Guarantee shall not exceed……[8]

b) This Guarantee shall be valid up to ……[9]

c) Unless the Bank is served a written claim or demand on or before _____[10] all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of

(Name of the Bank)

Dated…….

Place of Issue…….

[1] *NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited*

[2] *NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.*

[3] *DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE*

[4] *PROJECT/SUPPLY DETAILS*

[5] *BG AMOUNT IN FIGURES AND WORDS*

[6] *VALIDITY DATE*

[7] *DATE OF EXPIRY OF CLAIM PERIOD*

[8] *BG AMOUNT IN FIGURES AND WORDS.*

[9] *VALIDITY DATE*

[10] DATE OF EXPIRY OF CLAIM PERIOD

Note:

1. **Units are advised that expiry of claim period may be kept 2/3 months after validity date.**

2. **In Case of Bank Guarantees submitted by Foreign Vendors-**

   a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.

   b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**

   b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank (BHEL's Consortium Bank). It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.

   b.2 **In case, Foreign Vendors intend to provide BG from** Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.

   b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). In case, of Foreign Vendors, the BG Format provided to them should clearly specify the same.

   b.4 The BG should clearly specify that the demand or other doc

SECTION – 8

NON DISCLOSURE AGREEMENT

Confidentiality Agreement

This **CONFIDENTIALITY AGREEMENT ("Agreement",** which expression shall unless it be repugnant to the subject or context thereof, include all schedules and amendments thereof made from time to time) is made on the date set out in Schedule) hereof (the " **Effective Date**") between the person (s) named in Schedule hereof (the " **Receiving Party**") of the One Part.

And

BHEL LIMITED, a company incorporated under the companies Act, 1956 and a banking company within the meaning of the banking Regulation Act. 1949 and having its registered office at / its corporate office at BHEL Towers, ---------- and the Zonal branch/branch office at_____ ("**BHEL**", which expression shall, unless it be repugnant to the subject or context thereof, include its successors and assigns) of the Other Parts.

The Receiving Party and BHEL are hereinafter collectively referred to as "Parties and individually as a "Party",

PREAMBLE:

(i) BHEL is considering a project involving --------- (Insert Company Name & brief description of Project), the Receiving Party (" the Project"), as more particularly specified in detail in Schedule 2 of this agreement for which BHEL will divulge certain information to the Receiving Party which at present is confidential and not in the public domain.

(ii) BHEL intends that the aforesaid information be kept confidential as between the Receiving Party and BHEL and the Receiving Party undertakes and declares that it shall not divulge, publish or reproduce the same before and person except in accordance with the terms of this Agreement.

THEREFORE, IN COSIDERATION OF BHEL making available such confidential information as aforesaid to the Receiving Party, the Parties agree as follow

(1) For the purpose of this Agreement, "AFFILIATE" of BHEL shall mean and include:

(a) Any company which is holding company or subsidiary of BHEL, or

(b) A person under the control of or under common control with BHEL, or

(c) Any person, in more than 26% of the voting securities of which BHEL has a direct or beneficial interest.

For the purpose of this Affiliate and Agreement, "control" together with grammatical variations when used with respect to any Person, means the power to direct the management and policies of such Person, directly or indirectly, Whether through the owner ship of the vote carrying Securities, by contract or otherwise however; and "Person" means the company, corporation, a partnership, trust or any other entity or organization or other body Whatsoever.

(2) The Receiving Party hereby agrees that all the confidential, proprietary or trade secret information relating to BHEL including without limitation, information regarding the business operations, financial information, customer information and marketing strategies of BHEL and any notes, compilations, studies, interpretations, presentations, correspondence or other writing made available to the receiving Party by BHEL whether in physical or electronic form, whether after the effective date or prior to the execution of this agreement, and in specifically marked " **CONFIDENTIAL"**, INCLUDING any verbal indication that has been documented in writing and marked as "**Confidential Information**". The receiving Party agrees that all the confidential Information shall be treated as absolute secret and the receiving Party shall not disclose to any person such information otherwise than in accordance with the terms of this Agreement. The Receiving Party will impose a similar duty of confidentially on any person to whom the Receiving Party is permitted to transfer such information in accordance with the terms hereof.

(3) The receiving Party shall not, without the prior written consent of BHEL, display or disclose all or any part of the confidential Information, in any manner or circumstances whatsoever, to any person or any third party and all Confidential Information contained herein shall be used by the receiving Party, directly or indirectly solely for the purpose of considering, evaluating and effecting the Project. The receiving Party shall not use the Confidential Information in any way detrimental to BHEL.

(4) The receiving Party hereby represents that any employee or any official of the Receiving Party who will be given access to the Confidential Information on behalf of the Receiving Party has executed/ shall execute appropriate non-disclosure contracts with the receiving Party for adequate protection of the confidential information belonging to BHEL and/or its

Affiliates against disclosure or exploitation. The receiving Party shall forthwith make available a copy of such contracts as and when required BHEL.

(5) The receiving party shall maintain a record of entities/persons to which the Confidential Information has been disclosed. This record shall be promptly made available to BHEL upon request.

(6) Without limiting the above, the Receiving Party further undertakes:

(i) Not to disclose that the confidential Information is or has been or will be made available or that evaluation of the Confidential Information is being or has been or will be made.

(ii) Not to make copies of, or reproduce or display in any form and by any process, all or any of the Confidential Information, except in the form of notes or memoranda, whether in physical or electronic form, made by Receiving Party employees/ officials during their evaluation of the Confidential Information;

(iii) To limit the access to the Confidential Information solely to those of its directors, officials or employees who have reason to require access only on a "**need to know**" basis;

(iv) To ensure that each of such director, official or employee referred to in Clause 6 (iii) hereinabove, to whom the Confidential Information is disclosed, observes strictly, the restrictions as to use and disclosure contained herein;

(v) To return all Confidential Information to BHEL forthwith and within a period of 10 days upon request by BHEL or upon the Receiving Party or BHEL deciding not to proceed with the Project. Should BHEL permit the destruction of such Confidential Information, the Receiving Party shall destroy the Confidential Information, within the period as may be specified by BHEL and shall provide BHEL with written notice that such destruction has been carried out.

(vi) To use the Confidential Information solely for the purpose of considering, evaluating and effecting the Project as specified in Schedule 2 hereto and to take all steps necessary to protect the secrecy of the Confidential Information from falling into the public domain or into the possession of unauthorized persons.

(vii) To keep confidential the fact of existence of discussions between the Receiving Party and BHEL concerning the Project, unless otherwise required by law and not make any private or public announcement or statement concerning or relating to the Project.

7. The restriction on use and disclosure set out above shall not apply to any Confidential Information which at the date of its disclosure to the Receiving Party is public knowledge or which subsequently becomes public knowledge other than by way of a breach of the terms of this Confidentiality Agreement; Or was available to the Receiving Party prior to its disclosure to the Receiving Party by BHEL under the terms of this Agreement; Party by BHEL under the terms of the Agreement: or is required to be disclosed by way of a legal process regulation or Government order, decree, regulation or rule; Provided herein after that for the purposes of the above section, such circumstances as defined above shall be tangibly proved to the satisfaction of BHEL in order to qualify as an exception under this category.

8. The Receiving Party agrees that all Confidential Information shall remain the property of BHEL or its Affiliates and that BHEL may use such confidential information for many purposes without any obligation to the Receiving Party. Nothing contain herein shall be construed as granting or implying any transfer to rights (including license rights) to the Receiving Party in the Confidential Information.

9. The Receiving Party agrees and understands that by the furnishing or making available of the confidential information, neither BHEL nor any of its agents are making any representation or warranty express or implied as to the accuracy or completeness of the confidential information. BHEL shall not be liable to the Receiving Party or any other person to use of the confidential information.

10. The Receiving Party shall immediately notify BHEL of any known or suspected breaches of this Agreement and shall give BHEL Full Corporation in any search or security.

11. If either party decodes that it does not wish to proceed with the Project, such party will promptly advice the other party shall forthwith return all confidential information to BHEL and shall not retain any copies of the same, in any form whatever. The receiving Party shall further certify compliance with this clause to BHEL forthwith in writing.

12. The Receiving Party hereby agrees to forth indemnify and hold harmless BHEL and its Affiliates from and against any claim and loss or damages, liability (including the legal fees) arising out of or in connection with any unauthorized or any other breach of the terms and

conditioning contained in this Agreement. This clause shall survive the termination or expiration of this Agreement.

13. The Receiving Party acknowledges that any breach of the terms and conditions of this agreement may cause BHEL irreparable damages for which recovery of money damages would be inadequate. Therefore, the Receiving Party agrees that BHEL or its nominee (in BHEL's sole discretion) shall be entitled, in addition to any other remedies available to it, to seek injunctive relief and/or from its employees/officials, or otherwise to protect its rights, under this Agreement.
14. in the event the Receiving Party is required to disclose Confidential Information upon an action, subpoena or order of a court of competent jurisdiction or of any requirement of legal process regulation or governmental order, decree, regulation or rule, the Receiving Party will immediately notify BHEL of its having received a request to so disclose (alongwith the terms and circumstances thereof), and consult with BHEL on action or steps to be taken in response to such request and shall finally execute any such request in accordance with the satisfaction of BHEL.
15. This Agreement shall be binding upon and shall inure for the benefit of the heirs (if applicable), successors and assigns of the Parties hereto.
16. This Agreement represents the entirety of the agreement of the Parties relating to the disclosure of the Confidential Information and shall not be waived, amended or assigned by either Party except by prior written consent of the other Party. No failure or delay by any party in exercising any right, power or privilege hereunder shall operate as a waiver thereof nor shall any single or partial exercise of any right, power or privilege. The rights and remedies herein provided shall be cumulative and not exclusive of any rights or remedies provided by law.
17. This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which taken together shall constitute one and the same agreement.
18. If any provision of this Agreement is determined to be unenforceable for any reason, then the remaining provisions hereof shall remain unaffected and in full force and effect.
19. This Agreement, the relationship between the Parties and all rights and obligations arising from any act done or required to be done under this Agreement and the terms herein shall be governed by and construed in accordance with the laws in India. The courts at Mumbai shall have the jurisdiction to try any matters arising out of or in connection herewith.
20. Nothing in this Agreement shall obligate either Party to consummate any transaction discussed as a result hereof.
21. This Agreement shall become binding on the Parties from the Effective Date and shall be in force such tenure as specified in Schedule I and shall remain in force for the entire term of the Project Notwithstanding anything contained herein, the obligations of Receiving Party Under this Agreement to retain secrecy of the Confidential Information shall however survive and be continuing until the Confidential information disclosed by BHEL is no longer confidential and is in public domain without any breach of the terms and conditions hereof by the Receiving Party.
22. Unless otherwise provided herein, all notices or other communications under or in connection with this Agreement shall be given in writing and may be sent by personal delivery or post or courier or facsimile at the address as specified in Schedule I hereto. Any such notice or other communication will be deemed to be effective if sent by personal delivery, when delivered, if sent by post, 4 (four) days after being deposited in the post and if sent by courier, one day after being deposited with the courier, and if sent by facsimile, when sent (on receipt of a confirmation to the correct facsimile number).
23. For the avoidance of the doubt, the owner hereby reserves the right at all times to file for / oblige for any applicable copyright / patent and / or any other licenses as applicable and to this effect the Receiving Party hereby undertake to ensure that there is no infringement of the owner's Intellectual Property Interest (IPR) at any time.

SCHEDULE I

1. **Effective Date:_____ day of _____ (Month).20_____ (year)**

2. **The Receiving Party:**

   _____, a company registered under the provisions of the Companies Act, 1956, and having its Registered Office at _____.

   The expression" Receiving Party" shall, unless it be repugnant to the subject or context thereof, include its successors and permitted assigns.

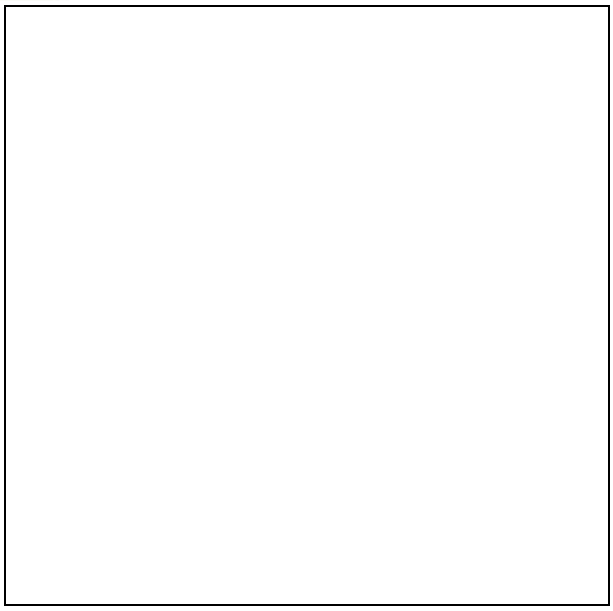
3. Tenure:---- Years
4. Address for Notices:
   If to BHEL:
   BHEL Limited,
   BHEL Towers,
   Siri Fort
   New Delhi 110049
   Facsimile Number:
   Tel No.:
   Attn:

   If to the Receiving party:
   [Address]
   Facsimile Number:
   Tel No.:
   Attn:

SCHEDULE 2

PROJECT

IN WITNESS WHEREOF, the Parties have caused the Agreement to be executed in the manner hereinafter appearing.



In the presence of:

1)

2)

AND

Signed and Delivered by BHEL
LIMITED, the within named BHEL by the
Hand of _____, its
Authorized official in the presence of:

1) _____;

2) _____.

APPENDIX 3.8A

TOTAL COST OF MANDATORY SPARES (TO BE CONSIDERED FOR EVALUATION)

SRL NO	CORRESPONDING TENDER SECTION/ CLAUSE	DESCRIPTION OF MANDATORY SPARE	PART NO OF THE SPARE	MANDATORY SPARES			
				UNIT PRICE	QUANTITY	UOM	TOTAL VALUE
Grand Total Z1							

*Add extra rows as required

APPENDIX: 3.8B

COMMISSIONING SPARES							
SRL NO	NAME OF EQUIPMENT	DESCRIPTION OF COMMISSIONING SPARES	PART NO OF THE SPARE	COMMISSIONING SPARES FOR EACH RIG (TO BE CONSIDERED FOR EVALUATION)			
				UNIT PRICE	QUANTITY	UOM	TOTAL VALUE FOR EACH RIG
1							0
2							0
3							0
4							0
5							0
6							0
7							0
8							0
9							0
10							0
11							0
12							0
13							0
14							0
15							0
16							0
17							0
18							0
Grand Total Z2							0

*Add extra rows as required

APPENDIX: 3.8C

TOTAL COST OF 4 YEARS OPERATIONAL SPARES (NOT TO BE CONSIDERED FOR EVALUATION)							
quotation	CORRESPONDING TENDER SECTION/ CLAUSE (IF ANY)	DESCRIPTION OF OPERATIONAL SPARE	PART NO OF THE SPARE	4 YEARS OPERATIONAL SPARES FOR EACH RIG (NOT TO BE CONSIDERED FOR EVALUATION) (TO REMAIN VALID FOR 5 YEARS FROM THE DATE OF COMMISSIONING OF THE RIG - ORDER PLACEMENT SHALL BE AT DISCRETION OF OIL)			
				UNIT PRICE	QUANTITY	UOM	TOTAL VALUE
1							0
2							0
3							0
4							0
5							0
6							0
7							0
8							0
9							0
10							0
11							0
12							0
13							0
14							0
15							0
16							0
17							0
Grand Total Z3 of 4 Years Operational Spares for Equipment not covered in AMC							0

*Add extra rows as required

APPENDIX: 3.9

TOTAL COST OF 4 YEARS OPERATIONAL SPARES FOR AMC EQUIPMENT (NOT TO BE CONSIDERED FOR EVALUATION)							
SRL NO	CORRESPONDING TENDER SECTION/ CLAUSE (IF ANY)	DESCRIPTION OF OPERATIONAL SPARE	PART NO OF THE SPARE	4 YEARS OPERATIONAL SPARES FOR AMC EQUIPMENT EACH RIG (NOT TO BE CONSIDERED FOR EVALUATION) (TO REMAIN VALID FOR 5 YEARS FROM THE DATE OF COMMISSIONING OF THE RIG - ORDER PLACEMENT SHALL BE AT DISCRETION OF OIL)			
				UNIT PRICE	QUANTITY FOR EACH RIG	UOM	TOTAL VALUE FOR EACH RIG
1							0
2							0
3							0
4							0
5							0
6							0
7							0
8							0
9							0
10							0
11							0
12							0
13							0
14							0
15							0
16							0
17							0
Grand Total Z4 of 4 Years Operational Spares for AMC EQUIPMENT							0

*Add extra rows as required