



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



Tender specifications for Pre-bid Tie-up for AC VFD Onshore Rig Equipment

Specification No. OE57146 Rev-02

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



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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 ~4 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.



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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 5 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 5 (five) years 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 5 (five) years till the completion of M/S OIL Contract with BHEL.
- 2.9 A one-time payment shall be paid to Pre-bid partner against the design documentation provided to BHEL and charges for design documentation shall be considered for evaluation of L1 bidder.

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 5 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



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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. BHEL PO quantity for the rig equipment shall be for the order received by BHEL from M/S OIL.
- 3.12 PO for 3 years' operational spares shall be placed separately after receipt of spares order from M/S OIL.
- 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 of respective personal/s to BHEL (upon request) for documents verification requirement.**
- 3.15 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's average net worth (Paid up share capital + Reserves) should be positive based on latest audited accounts for the last three consecutive financial year ending on 31st March (for financial years 2016-17, 2017-18, 2018-19) or 31st Dec (for financial years 2017, 2018, 2019) as applicable for the Bidder.
 - 4.1.2 Bidder to submit last three consecutive year's (2016-17, 2017-18, 2018-19 for financial year ending on 31st March **OR** 2017, 2018, 2019 for financial year ending on 31st Dec) Balance sheet/D&B report including the profit and loss account and net worth duly audited by a Chartered Accountant



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Technical :

- 4.2 The Bidder must have valid API 8C, **PSL-2 certification** for Top Drive components (**Power Swivel and Guide dolly**) (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 (2000 HP or higher), AC Top Drive (500T or higher), **AC VFD House** & 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) for minimum 10 (ten) years (period as stated shall be reckoned from the date of opening of Bid Part-1) To be substantiated by documentary evidence as per Annexure-3A. **Bidder must have supplied** at least 5 (five) **numbers** sets of **each-of** Draw-Works (2000 HP or higher), Top Drive system (500T or higher) and Drilling Control System (**each set consisting of a Draw-Works, Top Drive and Drilling Control System**) for Drilling Rigs of 2000 HP or higher capacity in last 9 (nine) years to Oil exploration & production companies / Drilling Contractors / Drilling service providers to Oil and Gas industry (period as stated shall be reckoned from the date of opening of Bid Part-1). To be substantiated by documentary evidence as per Annexure-3B.

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, Hydraulic Catwalk, Centralised HPU, **Casing running Tool**, Rig Instrumentation, AC Mud Pump, Hydraulic Power Slip, Hydraulic Cathode 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

- 4.5 Bidder must be an Original Equipment Manufacturer (OEM) for Hydraulic Mast & Hydraulic Substructures (of min. hook load capacity 1000 Kips) meant for on-shore deep drilling rigs. Bidder must have manufactured and supplied at least 2 nos. of Hydraulic Lift Mast & Substructures of hook load capacity 1000 Kips or higher in last 5 (five) years (5 years' period as stated shall be reckoned from the date of opening of PART BID-1). Bidder to submit API-4F certificate for the facility from which 2 sets of Mast & Substructure are supplied.

OR

Bidder should be a designer of Mast & substructure having design capability for Hydraulically raised Mast & Substructure. Bidder should have supplied minimum 2 number of such mast & substructure of 1000 Kips or higher hook load capacity in last 5 years bearing API 4F monogram. (To be substantiated by Experience List of contracts for



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rigs supplied in last 5 years along with API-4F certificate of the manufacturer). Such bids shall also be accompanied by a declaration from the manufacturer of Mast & Substructure that their supplied mast & substructure is as per Bidder's design.

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

4.6 Deleted

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 tender issued by M/s OIL (Reference OIL Tender No. SDG4874P21/09).
- 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 The bidder shall set up a base in India to deal promptly with any technical issues arising during the normal warranty / guarantee period (as stated elsewhere in this NIT). Bidder should additionally confirm that they will keep their technical personnel at OIL's Headquarter Duliajan, Assam for trouble shooting & providing timely warranty/guarantee repair/replacement/operational & maintenance support services on regular basis during the normal warranty / guarantee (as stated elsewhere in this NIT) for a period of 1 year (12 months) from successful commissioning of each rig equipment at site.
- 5.4 The bidder shall provide schedule of activities for completing the delivery and third party inspection of rig equipment within 30 days from the date of LOA/PO.
- 5.5 The bidder shall provide the maintenance / service / calibration facilities in India, for all the equipment / sub-component to be supplied under the contract.
- 5.6 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 spares for all the equipment to be supplied under the contract.
- 5.7 The bidder shall provide AMC for 4 years from date of completion of warranty 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.
- 5.8 All future spares requirement of the equipment in scope of Pre-bid partner shall be routed thru BHEL for the rigs supplied to M/S OIL by BHEL against this tender. Bidder shall not directly supply such spares to M/S OIL.
- 5.9 Bidder shall undertake assembling / installation and commissioning of supplied equipment in India at BHEL Hyderabad works and at the rig locations to the satisfaction of M/s BHEL & M/s OIL. The broad scope of Installation and commissioning is provided as **Section 3.2 of this document**.
- 5.10 Bidder shall undertake training for Operation & Maintenance personnel as per the scope of work defined in the tender **Section 3.3 of this document**.
- 5.11 The bidder shall supply latest version of the all the software used in drilling control system/ instrumentation system/VFD/Hydraulic Cylinder for raising of Mast & Substructure etc., available at the time of delivery/ commissioning.
- 5.12** The control system software for drilling control system/ instrumentation system/VFD/Hydraulic Cylinder 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 to OIL for end of equipment cycle.



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5.13 Bidder shall give undertaking to apply Bidder's Brand Name Plate (Logo) for AC Mud Pumps, and Hydraulic Catwalk which shall be manufactured at BHEL Works strictly with Bidder's design, support, guidance, and quality plan. In case, bidder offers to apply Brand Name Plate (Logo) of OEM, undertaking from the OEM shall be submitted

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 at least 10 years of manufacturing experience and should have supplied minimum of 05 nos. of equipment of tendered capacity/rating or higher capacity /rating to Oil India Limited (~~directly or indirectly~~) or any of the companies mentioned below during the last 10 years from date of Part-1 bid opening. **(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):**

- | | |
|-------------------------------------|-----------------------------|
| 1. ONGCL | 2. Atwood Oceanic |
| 3. Diamond Offshore | 4. ENSCO |
| 5. KCA Deutag Drilling | 6. Hercules Offshore |
| 7. Nabors Industries | 8. Noble Corporation |
| 9. Parker Drilling | 10. Pioneer Energy Services |
| 11. Weatherford/ Precision Drilling | 12. SAIPEM |
| 13. Schlumberger | 14. Transocean |
| 15. Pride International | 16. Global SantaFe |

Note 1:

In case of any merger/ acquisition of aforesaid companies with any other company, the bidder should clearly bring out the same and submit documentary evidence accordingly. Experience details in respect of above should be submitted as per attached format at Annexure-~~3A & 3B~~ along with documentary evidence ~~as detailed below:~~

~~Documentary evidence in respect of the above should be submitted in the form of copies of relevant Purchase Orders along with copies of any of the documents in respect of satisfactory execution of each of those Purchase Orders, such as — (i) Satisfactory Inspection report (OR) (ii) Satisfactory supply completion / Installation report (OR) (iii) Consignee Receipt Delivery document (OR) (v) any other documentary evidence that can substantiate the satisfactory execution of each of the purchase orders cited above.~~

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.

Note 3:

~~A job executed by a bidder for its own organization / subsidiary cannot be considered as experience for the purpose of meeting PQR.~~



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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 2000 HP AC Draw works complete with AC drive motors and gear box and other accessories.
- 2.0 Supply of AC Motor driven 500Ton 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, Hydraulic Catwalk.
- 4.0 Supply of Rig instrumentation system.
- 5.0 Supply of AC VFD House Items package for PCR-1,2 & 3. Supply of Complete manufacturing documents, assembly and testing of PCR1,2&3 at BHEL works.
- 6.0 Supply of Hydraulic BOP Cart item package. Supply of Complete manufacturing documents, assembly and testing of BOP cart at BHEL works.
- 7.0 Supply of Iron Roughneck
- 8.0 Supply of Hydraulic Catwalk items package. Supply of Complete manufacturing documents, assembly and testing of Hydraulic Catwalk at BHEL works.
- 9.0 Supply of 1600/1700 HP AC Mud Pump items package. Supply of Complete manufacturing documents, assembly and testing of AC Mud Pump at BHEL works.
- 10.0 Supply of one no. IRD AC motor as per cl.no. 1.24 of Section-3.1.1 under technical specifications.
- 11.0 Supply of Hydraulic cylinders for raising/lowering of Mast & substructure along with Hydraulic Power Unit (HPU) and its controls.
- 12.0 Commissioning of bidder's supplied equipment and Integration of other equipment supplied by 3rd party (like AC Mud pump, Independent Rotary Drive System, Hydraulic Cathead, Hydraulic Catwalk, CRT, VFD house etc.) with Drilling control system. BHEL shall provide resources (Crane, power, welding facilities etc.) including unskilled work force.
- 13.0 Supply of complete design documentation for Hydraulically raised Mast, Substructure & Crown Block and accessories of rated capacity (Minimum 1250 Kips Hook load capacity) for Onshore deep drilling AC VFD rig. Manufacturing, assembly and testing at BHEL works.
- 14.0 Supply of complete manufacturing documentation of Centralised HPU. Manufacturing, assembly and testing at BHEL works.
- 15.0 Training of M/s OIL Engineers for the equipment to be supplied by pre-bid partner.



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- 16.0 Training of BHEL/M/S OIL Engineers for raising and lowering of mast & substructure.
- 17.0 Supply of Spares thru BHEL for the equipment supplied by pre-bid partner.
- 18.0 Annual Maintenance Contract for the equipment detailed in section 3.9.
- 19.0 Installation & commissioning support for equipment detailed in section-3.2.
- 20.0 Supply of Detailed operation, maintenance & troubleshooting manuals
- 21.0 Supply of Commissioning spares, common mandatory spares and mandatory spares.
- 22.0 Supply of spares for 3 years' normal operation for the equipment covered under AMC. Cost of these spares shall not be considered for bid evaluation.
- 23.0 Supply of 3 years' Operational spares (for other than AMC equipment). Cost of 3 years' Operational spares shall not be considered for bid evaluation.



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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



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ANNEXURE-3A

Format for supply experience of 10 years for Equipment's

Documents required for manufacturing and Supply experience to qualify PQR															
Sl. No	Name of Rig	Description of Supplied Equipment with make, model and Capacity etc.	Name and address of manufacturer	Name of customer with address	Contract / PO Details (order copy to be enclosed) for supply of Drilling Rigs and Equipment			Documentary evidence in respect of satisfactory execution of orders (copy to be enclosed)							Attached document reference in bid
								Details of Corresponding Invoice submitted			Details of Corresponding BL/LR submitted			Any other document *	
					PO No	Date	Qty	Invoic e No	Date	Qty	BL/LR No	Date	Qty		
1		Draw works													
2		Top drive													
3		Drilling Control system													

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

- (i) Signed and sealed Satisfactory supply / completion report (in original letter head of the user) (OR)
- (ii) Bill of Lading (OR)
- (iii) Consignee delivery receipt / challan (OR)
- (iv) Central Excise Gate Pass/Tax Invoice issued under relevant rules of Central Excise/Vat/GST (OR)
- (v) Commercial Invoice/ Payment Invoice

This should be furnished for all the equipment covered in scope of supply.

In respect of each Manufacturer for a particular equipment two copies of documents are required to be furnished.

1. For supply experience of more than 10 years for at least 1 no.

Note:

- 1.0 A job executed by a bidder for its own organization / subsidiary cannot be considered as experience for the purpose of meeting PQR.
- 2.0 Same company will be considered as same make



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ANNEXURE-3B

Format for supply experience of 5 sets of Equipments

Documents required for manufacturing and Supply experience to qualify PQR															
Sl. No	Name of Rig	Description of Supplied Equipment with make, model and Capacity etc.	Name and address of manufacturer	Name of customer with address	Contract / PO Details (order copy to be enclosed) for supply of Drilling Rigs and Equipment			Documentary evidence in respect of satisfactory execution of orders (copy to be enclosed)							Attached document reference in bid
								Details of Corresponding Invoice submitted			Details of Corresponding BL/LR submitted			Any other document *	
					PO No	Date	Qty	Invoice No	Date	Qty	BL/LR No	Date	Qty		
1		Draw works													
		Top drive													
		Drilling Control system													
2															
3															
4															
5															

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

- (i) Signed and sealed Satisfactory supply / completion report (in original letter head of the user) **for all 5 sets OR AND**
- (ii) Bill of Lading (OR)
- (iii) Consignee delivery receipt / challan (OR)
- (iv) Central Excise Gate Pass/Tax Invoice issued under relevant rules of Central Excise/Vat/GST (OR)
- (v) Commercial Invoice/ Payment Invoice

This should be furnished for all the equipment covered in scope of supply.

In respect of each Manufacturer for each set of equipment, two copies of documents are required to be furnished.

Note:

- 1.0 Extra columns and rows may be added as per requirement.
- 2.0 A job executed by a bidder for its own organization / subsidiary cannot be considered as experience for the purpose of meeting **PQR**
- 3.0 **Same company will be considered as same make**

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



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AC VFD Onshore Rig Equipment**

Specification No. OE57146 Rev-02

SECTION – 2

INSTRUCTION TO BIDDERS (GENERAL TERMS & CONDITIONS)



Tender specifications for Pre-bid Tie-up for AC VFD Onshore Rig Equipment

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(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



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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 envelopes 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 Two-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, <u>except The price.</u> 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. All techno commercial terms & conditions mutually agreed prior to price bid opening shall prevail and supersede any terms and conditions specified otherwise in price bid.		Non Deviatable



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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		
	Seller shall arrange to send to BHEL, Hyderabad along with all the required documents as detailed in Purchase Order, such as, Tax Invoice (Original for Recipient, Duplicate for Transporter), consignee copy of LR, Packing list , Pre-dispatch Inspection report, Test/ Guarantee/ Warranty certificate/ O&M manuals (as applicable) etc. immediately on dispatch of the goods. Any addition/ exclusion to such documents shall be as specified in the Purchase Order. In case of dispatches from vendor works to site, material receipt certified by site office / Customer shall be provided. Softcopies of the above documents shall be uploaded in Pradan portal https://web.bhelhyd.co.in/mm/ immediately after dispatch of the material	FOR INDIGENOUS BIDDERS	Non Deviatable



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B	Imports (i). Seller shall inform the purchaser the readiness of material along with packing details well in 30 days advance from the date of delivery. Seller shall also upload soft copy of the dispatch documents consisting of Bill of lading, Invoice, Shipping list & Test certificates and other documents as specifically indicated in the Purchase Order (PO) in PRADAN Portal (https://web.bhelhyd.co.in/mm/) within 3 days from the B/L date for sea shipment and 1 day from AWB date for Air shipment or as mentioned in BHEL PO. On BHEL web portal or shall email the same at address indicated in PO within 3 days from the B/L date for sea shipment. (ii). In case the material shipped in Full Containers(FCL), Seller shall ensure that the Bill of Lading should clearly spell out the following 1. Port of discharge – JNPT Nava Seva/ Mumbai port. 2. Place of Delivery / Final Destination – Mumbai. 3. For air consignment the port of discharge will be Hyderabad, India and consignee shall be BHEL. 4. Any break bulk shipment, packing list and item details to be provided 60 days prior to shipping. iii) ----		
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(IV) In case of Air shipment, the following dimensions of single package may be noted.

a). Dimension of the cargo(ODC) -- > 125" x 88" x 63"

b). Weight of the cargo -- >3.5 MT.

If any package dimension or weight crosses the above set limits, it will be treated as Over Dimension Cargo (ODC) or Over Weight Cargo and seller shall inform BHEL well in advance of 20 days prior to the delivery date to enable BHEL to finalize the freight forwarder

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

Seller 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, wharf age, storage, Ground rent etc., due to non – compliance / non – submission of documents prescribed in Purchase Order/Tender Document/Letter of credit , the same shall be recovered from the seller as under :

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

A. For EX-WORKS / FCA/ FAS / 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 14 th day	Nil	Nil	Nil
ii	15 th day onward	USD 10	USD 50	USD 105

(vi) Description of items in invoice, packing list, BL / AWB or LR shall be same as PO item description. Vendors shall ensure that invoice shall contain all tax related Nos of both seller and buyer. Any other additional documents sought by the statutory authorities, the same shall be produced by the seller on priority basis.

(vii) Seller shall provide package details including number of packages, gross weight, net weight etc.

(viii) The seller shall provide the following documents at the time of submission of offer :-

a) No Business Connection in India declaration issued by the seller as per the format specified. (or)

b) (i) No Permanent Establishment in India declaration issued by the seller as per the format specified.

(ii) Tax Residence Certificate issued by the seller's tax authorities.

(iii) Form 10F issued by the supplier.



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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. BHEL reserves the right to reject the material, if not delivered by scheduled Purchase Order Delivery Date.		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 shall not constitute acceptance of the goods or materials in any manner, whatsoever.		
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 2 years operational spares shall be valid for two years from the date of finalization of contract with M/S OIL.		
10	Taxes & Duties (RATE TO BE INDICATED by the bidder against the space provided)		
A	Indigenous Purchase FOR INDEGENOUS BIDDERS		
	The Taxes as applicable shall be quoted in the following manner.		
I	Vendor to indicate HSN of Goods or SAC of Services. FOR INDEGENOUS BIDDERS		
ii	IGST/CGST/SGST/UTGST: Rate of Tax to be quoted as extra in %	FOR INDIGENOUS	
	NOTE: Bidders to ensure correct applicability of IGST/CGST/SGST/UTGST based on the Inter / Intra state movement of goods. Taxes prevalent on the contractual delivery date or the actual delivery date (incase of delay) which ever is lower shall be applicable paid. In case Bidder has opted for GST Composition Scheme, the same may be stated explicitly both in their technical and price bids.	FOR INDIGENOUS BIDDERS	
iii	Any other taxes & duties not covered anywhere above may be indicated separately.	FOR INDIGENOUS BIDDERS	



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iv	Taxes deducted at source: TDS as per the extant statute shall be recovered. In case vendor does not provide PAN details/concessional certificates, the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act.	FOR INDIGE NOUS BIDDE RS	Non Deviatable
B.	Foreign Purchase (Imports)		
i	The offered price shall be inclusive of all the Taxes and duties as applicable in country of bidder / country of dispatch for the quoted price.		Non Deviatable
ii	Taxes deducted at source: TDS as per the extant statute shall be recovered. In case vendor does not provide PAN details/concessional certificates, 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 complete documentation 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 & PBG. 2) Balance 20% payment for material portion shall be released 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 thru Wire Transfer / E-payment. 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 thru Wire Transfer / E-payment. 5) 100% for Documentation Charges for Mast & Substructure and Centralised HPU against certification by BHEL engineering group for the receipt of complete documentation within 90 days of the Invoice date. 6) 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. 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. 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	FOR INDIGE NOUS BIDDE RS	



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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 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 shall be opened after issuance of Performance bank guarantee by bidder. 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% for Documentation Charges for Mast & Substructure and Centralised HPU against certification by BHEL engineering group for the receipt of complete documentation within 90 days of the Invoice date for thru Wire Transfer / E-payment. vii) 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. viii) 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 security deposit / Performance bank guarantee @ 3% 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 of last rig of each lot.		
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 Rig wise lot order value 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 Rig wise lot order value for Material supply including spares, Installation & Commissioning and Training of M/S OIL personnel.		
13	Excess materials supplied beyond tolerance limit quantity as specified in PO, will not be accounted for.		Non Deviatable
14	Rejected materials , if any, shall be collected by the vendor within 21 days of such communication to the vendor .Beyond 21 days a ground rent of 0.25 % of the value of the material per week will be levied for a maximum period of two weeks. Beyond this period the supplier forfeits their right to the materials.		Non Deviatable



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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 s u c c e s s f u l commissioning of each rig package 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
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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.

16	Price Bid Evaluation and Loading Criteria : (Refer Section-5 of tender document for Price bid format & other details) :
A	Evaluation of prices shall be done for complete package (Equipment & services). Evaluation shall be on the basis of delivered cost, i.e. "Complete package cost to BHEL for 5 rigs" w.r.t the finalized technical scope and commercial conditions (after considering incidence of applicable taxes and duties and loading). For evaluation, exchange rate (TT selling rate of State Bank of India) as on the date of bid opening (Part-1) 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.
B	In case of foreign bidders, the quoted FOB price for material shall be loaded by the following factors to arrive at the Total landed material cost at BHEL Hyderabad :
i	- 0.5% of FOB value for unloading at Port of Destination in India. - Marine Freight 4% and Marine Insurance 1% of FOB Value. With this loading CIP value shall be arrived and shall be converted to Indian Rupees with SBI TT selling exchange rate.
ii	- Import Custom duty and other statutory taxes as applicable at the time of Price bid (Part-2 bid) opening date shall be applied on CIP value to calculate the landed cost after clearance at port in Indian Rupees.
iii	- Port handling/ clearing charges & inland freight and insurance: @ 3% on the above landed cost at port (16.B.ii) to arrive at the "Total landed material cost at BHEL Hyderabad"
C	In case of Indigenous Bidders, Ex-works offers received (as against FOR Destination mentioned in enquiry) shall be loaded by 4% of Ex-works value to arrive at the "Total landed material cost at BHEL Hyderabad"



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D	Deviated LD Penalty : Any loading on LD penalty clause shall be 10% or to the extent to which the vendor has opted for deviation. This is applicable for Material portion only.
E	Deviated Payment Terms : In case BHEL considers any deviation in payment terms, the bids shall be loaded with 18% interest per annum to the extent of deviation. This is applicable for both Material and Service portions of the bids.
F	In case the quoted Service Charges for Installation & Commissioning/ Training/ Documentation are in foreign currency, then quoted rates shall be converted to Indian Rupees by applying SBI exchange rate (TT selling) as applicable on the date of Part-1 bid opening. This shall be applicable for respective heads if quoted charges in foreign currency. These Charges in Indian Rupees then shall be taken for bid evaluation as per price bid format in Section-5.
G	In case the quoted Service Charges for Installation & Commissioning/ Training / Documentation are in Indian Rupees, then quoted charges shall be directly taken for bid evaluation as per price bid format in Section 5.
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 Vendors shall have to enter into Integrity Pact with BHEL as per Section-6 – for order value of rupees five crores and above and shall be signed by the competent authority before the issue of purchase order, failing which vendor's offer will be rejected.
20	Public Procurement
20 A	Make in India For this Procurement, the local content to categorize a supplier as a Class I local supplier / Class II local supplier / Non-Local supplier and purchase preference to Class I local supplier, is as defined in Public Procurement (Preference to Make in India), Oct 2017 dated 04.06.2020 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part – II bids against this NIT. Proforma for self-certification for minimum local content and auditor's certification is given in Annexure-5 .
20 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. 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-6
20 C	---



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21	For Indigenous bidders : For Claiming Payments for goods received at BHEL works / Site from Supplier Works) a. Original of Invoice marked as ORIGINAL FOR RECIPIENT b. Duplicate of Invoice marked as DUPLICATE FOR TRANSPORTER c. Packing List – clearly showing number of packages, gross weight and net weight. d. Warranty/Guarantee certificates (If applicable as per PO terms) e. Insurance certificate f. Third Party Inspection Certificates. g. LR Copy signed & stamped by Site incharge / Customer for site deliveries) (For material received at BHEL payment will be made against GR for accepted quantity)
22	Inspection Measuring and Test Equipment (IMTE) whether used by the Seller/ 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 and OHSAS 18001 shall be complied
24	Applicable Conditions :These General conditions of Contract for Purchase apply to all enquiries, tenders, request for quotations, orders and agreements concerning the supply of goods and the rendering of related services (hereinafter referred to as “deliverables”) to Bharat Heavy Electricals Limited, Ramachandra puram , Hyderabad & Bhopal (hereinafter referred to as “BHEL” or the Purchaser) or its projects/customers. Any deviations from or additions to these General conditions of contract for Purchase’ require Purchaser’s express written consent. The general terms of business or sale of the Seller shall not apply to Purchaser. Orders, agreements and amendments thereto shall be binding if made or confirmed by the Purchaser in writing. Only the Purchasing department of the Purchaser is authorized to issue the Purchase order or any amendment thereof.
25	Prices to be quoted in figures and words both. In case of any discrepancy in value, the prices quoted in words shall be considered for evaluation and establishing L1 Status
26	Any discount / revised offer / bids submitted by a bidder on its own shall be considered, provided it is received on or before the due date and time of Part-1 bid submission. Conditional discounts shall not be considered for evaluation of tenders.
27	In case of abnormal delays (beyond the maximum late delivery period as per Penalty clause) in supplies / defective supplies or non-fulfillment of any other terms and conditions given in Purchase Order, BHEL may cancel the Purchase Order in full or part thereof, and may also make the purchase of such material from elsewhere / equivalent market price at the risk and cost of the supplier. BHEL will take all reasonable steps to get the material from alternate source at optimum cost. If bidder does not agree to the above Risk Purchase Clause, BHEL reserves the right to reject the offer. Nonperformance of contract attracts penal provisions inline with BHEL’s Suspension of Business dealings.
28	Any other terms and conditions of the bidder attached / referred against the tender enquiry may not be considered.
29	Any amount payable by the consignor / supplier under any of the condition of this contract shall be liable to be adjusted against any amount payable to the consignor / supplier under any other work / contract awarded to him. This is without prejudice to any other action as may be deemed fit by BHEL.
30	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, shall be rejected. The list of firms banned by BHEL is available on BHEL web site www.bhel.com



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31	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.	
34A	'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.
34 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.
34 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.
35	'Parties to the contract' shall mean the seller and the purchaser as named in the main body of the Purchase Order.
36	Ordering and confirmation of order after Pre-Bid Tie up (MOU)
	The seller shall send the order acceptance in Toto within one week from the date of LOI/Purchase order or such other period as specified/agreed by the Purchaser. Purchaser reserves the right to revoke the order placed if the order confirmation differs from the original order placed. Purchaser shall only be legally bound if agreed explicitly in writing to be in agreement with the deviation. The acceptance of deliverables or supplies by Purchaser as well as payments made in this regard shall not imply acceptance of any deviations. The Purchaser 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 Purchaser) from the date of P.O. Purchaser, 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.
37	Execution
	The whole contract is to be executed in the most workman like manner, substantial and approved as per the contracted terms.
38	Progress Report
	The seller shall render such report as to the progress of work and in such form as may be called for by the Purchaser from time to time. The submission and acceptance of such reports shall not prejudice the rights of the purchaser in any manner. Seller shall communicate to BHEL immediately, change of address, ownership, contact person(s), the mobile numbers and e-mail of the dealing person concerned. Milestones shall be periodically updated by vendor/subcontractor through PRADAN Portal (https://web.bhelhyd.co.in/mm/). Non upadation will adversely affect service rating of vendor performance.



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39	Product information, Drawings and documents / Non-disclosure and Information 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 seller 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 Purchaser to erect, commission, operate and maintain the product. Such information and drawings shall be supplied in the number of copies agreed upon or at least three copies of each. 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 seller shall provide Purchaser with all information pertaining to the delivery in so far as it could be of importance to Purchaser. The seller 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 Purchaser has agreed to this in writing beforehand. The seller shall not be entitled to use the Purchaser's name in advertisements and other commercial publications including website without prior written permission from Purchaser. 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 Section-8 wherever applicable.
40	Inspection and Testing (Refer Section 3.4 for details)
40 A	The equipment / item shall be manufactured by approved quality system and each part/component may be inspected and tested by the Purchaser / authorized third party inspector nominated by purchaser prior to shipment and shall fully comply with relevant requirements of Purchaser. Purchaser has the right to inspect at any stage during manufacture/ delivery. In the event of rejection, Purchaser shall inform the seller accordingly and Purchaser shall be entitled to replacement or repair at his discretion or may proceed to terminate or cancel the agreement. All this, does not affect Purchaser's right to recover compensation.
40 B	Purchaser or his authorized representative shall be entitled at all reasonable times during execution to inspect, examine and test at the seller's premises the material and workmanship of all equipment / items stores to be supplied under the contract, and if the part of the equipment/items are being manufactured at other premises, the seller shall obtain for purchaser or his authorized representative permission to inspect, examine and test as if the said stores equipment / items are being manufactured at the seller's premises. Such inspection, examination and testing, if made shall not release the seller from any obligation under the contract. For indigenous suppliers all costs related to first inspection request shall be borne by the purchaser and the cost of subsequent inspections due to non-readiness of material/rework/ rejections shall be borne by the seller. In case of imports all inspection charges including third party inspections if any shall be borne by the seller. The cost of inspection staff/third party specified by the Purchaser shall be borne by seller unless otherwise specifically agreed. Whether the contract provides for tests on the premises of the seller or any of his sub-contractor/s, seller 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 seller unless otherwise specifically agreed in the contract. The Seller shall give the authorized representative of the purchaser reasonable notice in writing of the date on and the place at which any equipment / items will be ready for inspection/ testing as provided in the Contract. Annexure – 4 may be strictly be complied with for the time lines. Any delay in submission of the documents by the vendor will not alter the delivery date.



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41	Quality and Condition of the Deliverables
	The seller shall be responsible for compliance with applicable technical, safety, quality, environmental requirements and other regulations in relation to his products, packaging and raw and ancillary materials.
42	Packaging and Dispatch
	The seller 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 of 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 enquiry shall be fully complied. Each package must be marked with consignee name, P.O. number Package No. gross weight & net weight, dimensions (LxBxH) and seller'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 of 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 confirm to relevant regulations.
43	Delivery :
	Except as otherwise indicated in the Purchase order, delivery shall be FOB for imported orders. The delivery date (s) or delivery period (s) as stipulated in the agreement shall be firm and binding and shall apply to the entire delivery for each P.O. item. Partial shipments may however, be permitted by the purchaser on prior intimation from the Seller. Unless specifically agreed otherwise, transit insurance coverage will be by BHEL. Accordingly, the seller shall send an intimation to the Purchase officer/Manager giving Purchase Order No., shipping particulars, Invoice value etc., immediately on readiness of goods.
44	Late delivery Penalty
	The time or period of delivery as stipulated in the schedule of delivery shall be deemed to be the essence of the contract. Should circumstances arise whereby the deadline for an agreed delivery date(s) or period(s) is expected to be exceeded, the seller shall inform Purchaser hereof without delay. If delay in delivery is caused by any of the circumstances mentioned in clause 52 (Force Majeure) or which are caused exclusively by the acts of Purchaser, the Purchaser shall extend the time for delivery by a period which is reasonable having regard to all the circumstances in the case. If the Seller delays beyond any agreed delivery date(s) or period(s), Purchaser shall levy penalty for such delay @ 0.5% of the total order value per week of delay or part thereof, subject to a maximum of 7.5% of the total order value on agreed delivery schedule/milestones for completion. Total order value for above shall be Rig wise lot order value for Material, Service charges for Installation, Commissioning and Training for M/S OIL personnel However, penalty for delayed delivery will be calculated on 100% of the purchase order value if the material supplied cannot be put to intended use. The penalty will be charged on the value of the purchase order excluding statutory levies, freight and insurance wherever not included in the price. Penalty amount so determined along with applicable GST thereon shall be recovered. Imposition, recovery or settlement of this penalty shall not affect Purchaser's right to performance, compensation and termination of the agreement. For delay analysis, period referred in Annexure-4 will be considered as standard time lines for various major activities.
45	Transfer of Ownership and Risk
	The risk for the delivery remains with the seller until the goods are delivered at the agreed place. However ownership shall get transferred as per terms of purchase order in line with INCOTERMS.



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46	Price, invoicing and payment
	The agreed prices are fixed prices in the currency as specified in the Purchase Order. They shall include packing, forwarding, loading and carriage to the place specified by the purchaser and are exclusive of all applicable taxes, duties etc., except for those specifically agreed by the Purchaser. Invoices shall be submitted bearing the Purchase Order number & date, item number/s and supporting documents as called for in the Purchaser order. The direct payments (including LC/documents through Bank on collection basis), shall be made by E-payment mode and not by cheque /bank drafts except in special circumstances. Vendors shall furnish the E-payment particulars in the prescribed formats duly authenticated by their respective Bankers, If not got registered earlier with the Buyer. Invoice has to be raised quoting HSN Code of Goods or Accounting Code of Services. Invoice should mention BHEL-HPEP-HYDERABAD GSTIN: 36AAACB4146P1ZG or GSTIN of BHEL Nodal Agency as mentioned in PO.
	Indian Agency commission if payable and so specified in the Purchase order shall be paid in Indian Rupees, considering the SBI TT selling exchange rate prevailing on the date of tender opening (part 1 in case of two part bid), after successful completion of the contract. If so stipulated in the order, the seller shall furnish, on receipt of the Purchase Order or along with order acknowledgement, the billing break-up of prices (BBU) for approval by the purchaser in respect of the major items/components going into the equipment. This BBU is required by the Purchaser for admitting the claims of the seller if part shipments are contemplated and also to facilitate custom clearance after payment of duties in case of imports. In case of delay in receipt of supporting document details, consequential demurrage/wharf age /detention charges shall be to the account of the seller. Payment does not imply in any respect whatsoever a waiver of Purchaser's right to performance of the agreement. Purchaser is entitled to set off claimable debts against claimable liabilities with the seller by means of a setoff Note.
47	Contract variations; Increase or decrease in the scope of supply
	Purchaser may vary the contracted scope during execution due to exigencies of project requirement. If the seller is of the opinion that the variation has an effect on the agreed price or delivery period, Purchaser 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 seller. Provided, that if unit rates are available in the contract, the same shall be applied to such additional work. The seller shall not perform additional work before purchaser has issued written instructions/amendment to the purchase order to that effect. The work which the seller 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 vendor without any price implication.
48	Short shipments/ warranty/guarantee replacements
	In case of any short shipment during initial supply which is subsequently dispatched by the seller 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. Taxes, if any paid by indigenous vendor for short supply, guarantee /warrantee replacement, repair activity shall be to vendor's account only. Vendor has to raise a credit note for short supplied quantity as per GST provisions.
49	Rejection/Replacement



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	The seller shall arrange replacement / repair under its obligation under the contract within one month from the date of intimation or mutually agreed period. The rejected goods shall be taken away by the seller and replaced on DDP/FOR-BHEL Stores/designated destination basis within such period. In the event of the seller's failure to comply. Purchaser may take appropriate action including disposal of rejections, at the cost and risk of the seller. Vendor has to raise a credit note for rejected quantity as per GST provisions.
	In case defects attributable to seller are detected during processing of the goods at purchaser's / his subcontractor works, the seller shall be responsible for replacement /repair of the goods as required by the purchaser at seller's cost.
50	Export Administration Regulations
	If a delivery includes such technology and / or supply that is subjected to the export regulations the seller shall obtain due permissions, approvals, license etc.
51	Cancellation / Termination of contract and risk purchase
	Purchaser shall have the right to completely or partially terminate the agreement by means of written notice to that effect without prejudicing their other rights in the event that : -The seller is declared bankrupt, its business has been shut down or liquidated, a substantial part of its assets have been attached/destroyed, or the business has been transferred to a third party. -Any misrepresentation or hiding of material fact if detected at a later stage. -The delivery is rejected after inspection or re-inspection. -In the event of termination, the risk of the items already delivered but not of use to Purchaser, as determined by purchaser, remains with the seller. The items shall then be at the seller's disposal and they are to be collected by the seller. The seller shall refund any payments made by purchaser in terms of the terminated agreement immediately, not later than 30 days, - In the event of Cancellation/ termination of contract, BHEL reserves the right to procure the items which are not delivered as per PO and charge the excess cost from the defaulting seller. Incase the excess cost is not repaid by or recovered from the defaulting seller within 30 days, apart from legal recourse for effecting such recoveries, Penal action in line with BHEL's Suspension of Business dealings will be taken.
52	Force Majeure
	The supplier 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 supplier 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 supplier shall refund any amount advanced or paid to the supplier by BHEL and deliver back any material issued to him by BHEL and release facilities, if any provided by BHEL.
53	Non-waiver of Defaults
	If any individual provision of the contract is invalid, the other provisions shall not be affected.
54	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 Purchaser, subject to written appeal by the seller to the purchaser, 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 seller shall continue to perform the contract, pending settlement of disputes(s).



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55	Arbitration & conciliation clause and Interest clause : (I).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, validity or execution of the contract; 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 of an arbitrator appointed by head of the BHEL unit issuing the contract. 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 at Hyderabad/Bhopal. The cost of arbitration shall be borne as per the award of the Arbitrator. Subject to the arbitration in terms of clause 55, the courts at Sangareddy, Telangana State / Bhopal MP state shall have exclusive jurisdiction over any matter arising out of or in connection with respective contract/Pos. 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. In case of contract with Public Sector Enterprise (PSE) or a Government Department, the following shall be applicable: In the event of any dispute or difference relating to the interpretation and application of the provisions of the contract, such dispute or difference shall be referred by either party for arbitration to the sole arbitrator in the Department of Public Enterprises to be nominated by the secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the arbitrator shall be binding upon the parties to the dispute, provided, however, any party aggrieved by such award may make further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law and justice, Government of India. Upon such reference the dispute shall be decided by the Law secretary or the special Secretary or Additional secretary when so authorized by the Law secretary, whose decision shall bind the parties hereto finally and conclusively. The parties to the dispute will share equally the cost of arbitration as intimated by the arbitrator. (2) INTEREST CLAUSE: In order to bring uniformity in all the contracts / agreements entered between BHEL and its contractors / vendors / suppliers / service providers etc., it is hereby advised to incorporate the following clause in all tenders and agreements. “No interest shall be payable by BHEL on earnest money or security deposit or any money due to the contractor by BHEL.”
56	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 or Bhopal Courts, Madhya Pradesh, India as the case may be for respective purchase orders.
57	BHEL-Fraud prevention policy shall be adhered to. The Bidder along with its associate/ Collaborators/ Sub-contractors/ sub-vendors/ 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. Fraud prevention policy and list of nodal officers is hosted on BHEL Hyderabad website web.bhelhyd.co.in



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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.



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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



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**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 of the bidder)."



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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

Sl No	Section	Title
1	SECTION – 3.1	TECHNICAL SPECIFICATION OF 2000 HP AC VFD RIG
2	SECTION – 3.2	INSTALLATION & COMMISSIONING AT BHEL AND M/S OIL SITE
3	SECTION – 3.3	TRAINING OF M/S OIL PERSONNEL
4	SECTION – 3.4	SCOPE OF THIRD PARTY INSPECTION
5	SECTION – 3.5	ADDITIONAL NOTE
6	SECTION – 3.6	PREFERED VENDOR LIST
7	SECTION – 3.7	DRAWING AND DOUCMENT SUBMISSION SCHEDULE
8	SECTION – 3.8	LIST OF SPARES
9	SECTION – 3.9	ANNUAL MAINTENANCE CONTRACT



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SECTION – 3.1

TECHNICAL SPECIFICATION OF 2000 HP ACVFD RIG

CONTENTS

Sl No	Section	Title
1	SECTION – 3.1.1	1250 Kips HOOK LOAD CAPACITY MAST, SUBSTRUCTURE, CROWN BLOCK AND ACCESSORIES
2	SECTION – 3.1.2	HYDRAULIC BOP CART
3	SECTION – 3.1.3	AC MUD PUMP
4	SECTION – 3.1.4	2000 HP AC DRAW WORKS
5	SECTION – 3.1.5	500T AC TOP DRIVE
6	SECTION – 3.1.6	VFD HOUSE FOR 2000 HP RIGS
7	SECTION – 3.1.7	DRILLER CABIN WITH CCTV & INTERCOM
8	SECTION – 3.1.8	RIG INSTRUMENTATION
9	SECTION – 3.1.9	IRON ROUGHNECK
10	SECTION – 3.1.10	HYDRAULIC CATWALK
11	SECTION – 3.1.11	CENTRALISED HYDRAULIC POWER UNIT
12	SECTION – 3.1.12	DRIVE MOTOR SPECIFICATIONS



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3.1.1. 1250 Kips HOOK LOAD CAPACITY MAST, SUBSTRUCTURE, CROWN BLOCK AND ACCESSORIES

Scope of Bidder and BHEL Hyderabad for manufacturing of Mast, substructure, Crown Block and accessories.
Bidder to confirm:

SL. NO.	BHEL SCOPE	Bidder's SCOPE	Bidder's Response
01	1. Main fabrication, assembly and testing of Mast, substructure, Crown Block and accessories. 2. Procurement of direct bought out items.	1. Supply of Hydraulic cylinders for raising/lowering of Mast & substructure along with Hydraulic Power Unit (HPU) and its controls 2. Supply of complete design documentation for Hydraulically raised Mast, Substructure & Crown Block and accessories. Documentation required is detailed at the end of the Technical specs, Section-3.1.1.	

1.1 Mast:

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	One (1) "Swing lift" Cantilever type Mast. Designed in accordance with latest API spec. 4F (PSL 2, SSL E2/U2). "Drilling and Well Servicing Structures". Mast should be designed to accommodate a 500 Short Ton (454 MT or 1000,000 lbs.) capacity top drive system Mast shall be designed to meet the transportation dimensions using heavy duty oilfield truck/tractor/trailer (ref section 11.1) and shall be equipped with the following:		
	Mast: Specification & Features		
1.1.1	Mast Specification:		
	Design and monogrammed	In accordance with API Spec 4F, PSL2, latest Edition.	
	Mast Type	Cantilever type swing lift mast	
	Mast Raising	Hydraulic Cylinders.	
	Mast clear height	Between 150-155 ft.	
	Base width	Between 30 ft-35ft	
	Static Hook load capacity	With 12 lines strung to the travelling block, min. 625 Short Ton (566.99 MT or 12,50,000 lbs)	
	Structural safety level (SSL)	E2, U2.	
	Max wind load capacity (No load)		



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	at set back)	125 mph (202 Kmph).		
	Max wind load capacity With rated set back	94 mph (151.3 Kmph).		
	Operating, Erection and Transportation Wind	Vendor to specify (Not less than per relevant clause of API-4F)		
1.1.2	Four (4) no of sheave unit with swivel mounted beneath crown frame with bronze bushings as: □ Two(2) Catline sheave □ One(1) power tong sheave □ One(1) Man Rider sheave			
1.1.3	Two (2) Set of complete leveling equipment system			
1.1.4	Two (2) Counter weight system. Details at Section 1.15 (Hydraulic power tong)			
1.1.5	One (1) Intermediate support frame (Belly board) including walkway and 3'-6" high hand rails. Rig nameplate to be installed at Belly board level.			
1.1.6	Access platform (fold up) with safety belt rope connecting loop to be provided at a) Stand pipe gooseneck connection including ladder along mast leg.(folded Platform at all the Hammer union joint position of Stand-Pipe) b) Sheave unit lubrication position.			
1.1.7	One (1) no of 16' high (Approximately) Mast stand equipped with lifting pad eye to support crown while pinning racking board. Includes wooden block headrest.			
1.1.8	One (1) set of 7.5' high (Approximately) mast assembly stands equipped with lifting pad eye to support mast section during assembly. Includes wooden block headrest.			
1.1.9	Pad eyes mounted in mast to accommodate: a) Two (2) – 10 MT or 20,046lbs) cat line sheaves. b) One (1) – 10 Short Ton (9 MT or 20,000 lbs) for man rider c) One (1) – 10 ShortTon (9 MT or 20,000lbs) for hydraulic power tong d) One (1) – 55 Short Ton (50 MT or 110,000 lbs) hang-off line for travelling block & TDS. e) One (1) – 55 Short Ton (50 MT or 110,000 lbs) hang-off TDS guide rails. Note: All pad eyes to be tested to one & half the SWL & certified according to relevant / applicable standards. All pad eyes to be painted safety yellow & marked with the SWL limit.			
1.1.10	One(1) block hanging line to hold travelling block and TDS when slipping drill line, length to match locking position of TDS (1 ¼"/31.75 mm)			
1.1.11	Hydraulic cylinders system for mast raising. Detail at			



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	Section 1.8 (Hydraulic cylinder)		
1.1.12	One (1) set of support material to mount deadline anchor on the mast bottom section as per OEM's design. Includes anchor bolts and working platform.		
1.1.13	One (1) set of full height straight ladder (complete with carrier rail, clamps, safety cage & two safety belts), with two rest platforms, between drill floor and monkey board. The ladder lengths should be equal to Mast Sections for ease of transportation.		
1.1.14	One (1) set of fall prevention system with complete provision for hooking up the same.		
1.1.15	Four (4) sets of Dual Stand pipe Clamps for 127 mm (5 inch) diameter standpipe to be provided on off-Drillers side of Mast complete with clamp cups & bolts.		
1.1.16	Mast sections shall be equipped with lifting eyes. Tested and certified.		
1.1.17	Lighting system: Each mast section should have an independent circuitry powered by a dedicated cable. All the light fitting's power receptacles on a particular mast section should powered by same cable. The aviation light at crown block should be part of the top most mast section circuit. The cables should be fixed to mast using easy to fit cable clamps which can be hand tightened. The clamp design should be such that cable fit into the groove and doesn't get damaged due to tightening. Power cable from each mast section should terminate at junction box situated in grasshopper cable tray. Two (2) area light directed towards rig floor situated on the lowermost horizontal beam of the mast. (Electrical to vet)		

1.2 Substructure:

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Slingshot type substructure that can be raised with all the derrick equipment installed on to the derrick floor. Substructure shall be raised by Hydraulic cylinders. Substructure shall be complete with all bracing and support material while in erect position and shall be constructed in accordance to API 4F PSL2 specification, latest edition. The substructure shall be designed to meet the transportation dimensions using heavy duty oilfield truck/tractor/trailer. (Ref –as per Transport dimension & limitation design)		
Substructure: Specification & Features			
1.2.1	Substructure: Specification		
	Design and monogrammed	In accordance with API Spec 4F, PSL2, latest Edition	
	Substructure Type	Slingshot type	
	Sub structure Raising	Hydraulic Cylinders	



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	Floor Height	Minimum 34 ft		
	Rotary clear Height	Minimum 29 Ft		
	Minimum Floor Dimension	Length 35 Ft (10.67 M) x Width 40 Ft (12.19 M) (Excluding the Doghouse-cum-Driller cabin and ODS Tool Room)		
1.2.2	Substructure Capabilities			
	Setback	Minimum 350 Short Ton (700000 lbs)		
	Rotary	Min. 650 Short Ton (1300000 LBS)		
	Hook load	Min. 625 Short Ton (1250000 lbs)		
	The setback load is simultaneous with the rotary load			
1.2.3	Equipment Accommodated: Rotary Table, Mast, Iron Roughneck, 2 nos. Air winch & Man rider winch, 2nos Hydraulic Cathead, BHEL make IRD, Driller's Control cabin, Draw Works			
1.2.4	Hydraulic cylinder system for sub structure raising. Details at Section 1.8			
1.2.5	Provision to transport rotary table along with the substructure section			
1.2.6	Min. Four (4) high lumen area lights (minimum Illumination level to be maintained) to provide enough illumination below substructure area			

1.3 Crown Block:

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	One (1) 650 Short Ton (13, 00, 000 lbs.) capacity Crown Block Assembly conforming to API Specification 4F & consisting of:		
	Crown Block:		
1.3.1	Working cluster consisting of at least six (6) nos. of sheaves, grooved for 1 ½" diameter wire line complete with tapered roller bearings. Shaft drilled with greased fitting for each bearing with grease seals. Sheaves shall be as per API-8C, PSL-2, monogrammed.		
1.3.2	One (1) no. of fast line sheave with bearing shaft and grease seals. Sheave shall be as per API-8C, PSL-2, monogrammed.		
1.3.3	One (1) set of wooden bumper blocks for safety fitted in the crown block.		
1.3.4	Line guards complete with sheave guard.		
1.3.5	Crown safety platform with checker plate flooring with at least 1 M (3'6") high handrails and toe plates, safety gate at ladder opening, and frame lifting eyes.		
1.3.6	Automatic crown pulley greasing system with pneumatic actuation from Rig floor.		
1.3.7	Arrangement for lowering crown block sheaves.		



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1.4 Racking Platform:

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Racking Board:		
1.4.1	Heavy duty racking platform with a capacity for 220 stands (in triples) of 5" Drill pipe of Range-II, and 8 stands (in triples) of 8" drill collar and 4 stands of 9 1/2" drill collars(in triples). The length of each single will be in the range of 9.14 M to 9.44 M (30 ft. to 31 ft.) & hence the treble's length will be 27.43 M to 28.35 M (90 ft. to 93 ft.). Height adjustable Platform shall be complete with access walk on driller's side platform with 7'-0" high Hand rails with toe-plates (guards). It should have foldable centre diving board with at least 1 M (3'6") high Handrails & toe plate on three sides and hinged extension with bracket to accommodate pullback winch. One (1) Escape line, including wire line, clips, thimbles and hand brake for emergency dual escape from racking board with complete provision for hooking up the same. One (1) Sure-Lock retractable lifeline complete with ground brackets to be mounted above diving board. (Escape device landing preferably towards Cat- walk side.)		

1.5 Stairs, Handrails and Escape slide:

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Stairs, Handrails & Escape Slide:		
1.5.1	One (1) Stairway from doghouse skid to ground. Landing platform at mid-level.		
1.5.2	One (1) Stairway complete with intermediate landing to extend from the drill floor level to the shaker tank area.		
1.5.3	One (1) set/lot of removable handrails 3.5 ft high with 230 mm high toe plate (guard) shall be provided for drill floor perimeter.		
1.5.4	Two(2) strong pull back post on either side of the V-door with two safety chains.		
1.5.5	One (1) Escape slide for fast evacuation from Derrick floor in case of emergency to be provided on Driller`s side		
1.5.6	All Stairs shall have chequered plate steps with anti-skid metal strip & removable hand rails. Stair width: 4'		



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1.6 V-Door Ramp and Stairs:

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
V-Door Ramp and Stairs			
1.6.1	One (1) V-door ramp (6 feet wide with 3/4" thick plate) from derrick floor down to catwalk elevation with framing continuing to ground level & complete with 3-inch diameter x 2 feet high pipe rail on both sides of the ramp. Necessary provisions to be kept/made for handling/lifting of tubular (approx. length 9m.) from inclined walk. Stairs should either be attached with ramp or a separate stair or star tower.		
1.6.2	The V-door ramp shall in no way hamper the lifting operations of tubulars with the Hydraulic Catwalk. The stairs located on the driller's side of the ramp shall have 1 M (3'-6") removable handrails. V-door ramp functionality shall be maintained if Hydraulic catwalk control system is not working.		
1.6.3	V-Door Ramp could be integrated with hydraulic catwalk or separate from Hydraulic Catwalk.		

1.7 Dog House & Driller Cabin And Tool Room Supports

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
Doghouse-cum- Drillers Cabin And Tool Room Supports:			
1.7.1	Two (2) sets of folding floor modules supports to accommodate Dog house integrated with driller's cabin on Drillers side. (Ref-Driller cabin)		
1.7.2	Tool room on off-Drillers side each on two supports. Support pins to Drillers and Off-Drillers side floor elevator boxes. (Ref-casing spooler)		

1.8 Hydraulic Cylinder For Mast And Substructure (Design and supply of Equipment)

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	The raising of Mast and substructure shall be with Hydraulic Cylinders. Advanced hydraulic cylinders shall be failsafe, multi stage, double acting, corrosion resistant, bleeder less type as per the rig design. Additional fail safe device to be provided (Mechanical stopper).		
Hydraulic Cylinder: Specification & Features :			
1.8.1	Hydraulic Cylinders Specification		
	Stages	Multi stage (Max. Three stage) double acting hydraulic cylinder. All stage retractable. Oil supply on barrel	
	Nominal pressure	3000 psi (in accordance with working pressure).	
	Test	4500 psi(in accordance with working	



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	pressure	pressure)		
	Working pressure	2500 psi (minimum)		
	Tang with spherical ball joint on the barrel and rod end (or as per design requirement).			
	Cylinder design to meet requirements from API specification 4F Latest edition.			
	Pressure testing to be performed according to API specification 4F Latest edition.			
1.8.2	Hydraulic Unit: Shall consist of 2 Nos. hydraulic pump unit separately driven with engine & electric motor having motor starter panel. The hydraulic pump shall have positive displacement gear/rotary pump, hydraulic oil reservoir, NRV / filters complete with suction and delivery lines. Pressure and volumetric requirement of the hydraulic unit shall match hydraulic cylinders. The engine & motor driven hydraulic pump shall be connected to the hydraulic pump through suitable power transmission mechanism so that the hydraulic pump can be engaged and disengaged as and when required. The engine & motor BHP shall match the maximum hydraulic HP of the Gear Pump. The hydraulic unit shall have relief value & lines to relieve pressure to reservoir tank. All delivery hydraulic lines shall withstand more than 10% MWP of the hydraulic pump. The unit shall be independent & separate from common hydraulic power unit. A common robust manifold complete with HP valves mounted on oilfield skid to be supplied and connected to both the hydraulic pump unit. Make of Hydraulic Pump : Chelsea Parker / Rexroth / Danfoss / Parker Hanfinn.			
1.8.3	Hydraulic cylinders should be operated from both unit and wired/wireless remote operation panel			
1.8.4	Hydraulic cylinders should be retracted and parked in sub structure after mast and sub structure up/down operation.			

1.9 Dead Line Anchor: (For information only to provide mounting details)

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Dead Line Anchor:		
1.9.1	One (1) Dead line anchor designed and manufactured and monogrammed to API specification 8C PSL-2 latest edition and should be with tension/ compression load cell (weather proof) to provide a signal for the Weight Indicator System, preferred location at bottom structure.		

1.10 4" x 7500 psi Dual Stand pipe - 60 ft: (For information only to provide mounting details)

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Dual 4" x 7500 psi standpipe x approximately 60' (ft) long; each complete as follows:		
1.10.1	4" Weco Fig 1002, 7500 psi butt weld hammers union at bottom and top connection, standard service.		



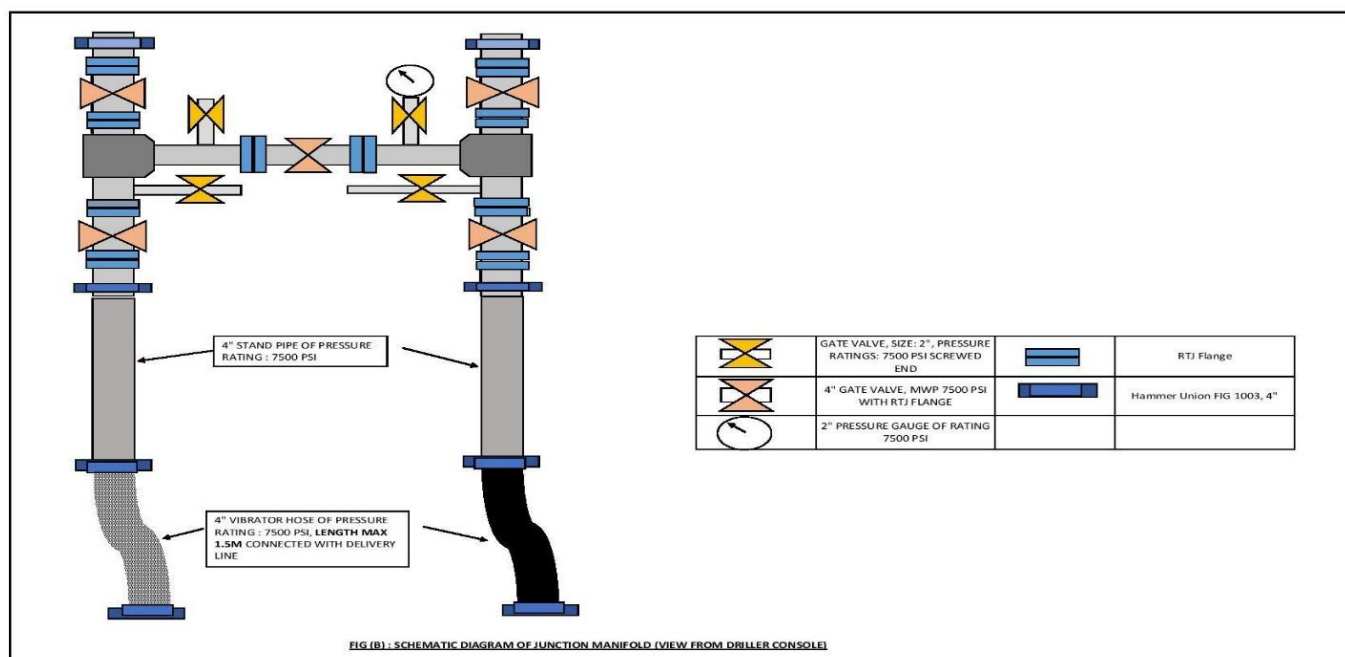
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1.10.2	4" x 7500 psi gooseneck 160degree, standard service		
1.10.3	(4"x4")x 7500 psi butt weld swages for Weco unions, standard service.		

1.11 Dual Standpipe Manifold - "H" Style, 7500 psi: Refer below Fig (For information only to provide mounting details)

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	7500 Psi WP Dual Stand Pipe Manifold:		
1.11.1	Five (5) Nos. of 4" flanged gate valves Max WP 7500 Psi		
1.11.2	Two (2) Single end 2" screwed end gate valves Max WP 7500 Psi		
1.11.3	Two (2) 4" x 4" long sweep full flow TEE (Sch.160)		
1.11.4	Four (4) 4", 7500 PSI (527 kg/sq-cm) WP misaligning union fig 1003 for standard service		
1.11.5	Ten (10) RTJ weld neck flanges 4" 7500 PSI (527 kg/sq-cm) bored for 4" SCH. 160 pipe with ring gaskets.		
1.11.6	Two (2) 4"x2" threads lets for pressure gauge and mud service connection with 2" screwed end gate valves Max WP 7500 Psi		
1.11.7	One (1) Kill line kit consisting of a suitable length of XXS pipe (150 meter), swivel joints & integral unions		
1.11.8	One (1) 9.14 M (30 ft) long HP hose of 3000 Min WP with 2" Fig 1002 Integral union at each end for Hole Fill Line.		
1.11.9	Two (2) 2" 7500 PSI (351 Kg/sq-cm/527 kg/sq-cm) Plugs		
1.11.10	One (1) 0-6000-10000 PSI gauge, type D, 2" Female		
1.11.11	Y connector change over adapter (2 female 1 male) to be supplied separately		
1.11.12	Required pipe nipples, nuts and bolts		
1.11.13	Forged reducing block Tee, 4" x 2" for cementing purpose		





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1.12 Cementing Line (For information only to provide mounting details)

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Cementing Line:		
1.12.1	One (1) single 2" XXS (15000 psi) cement standpipe for suitable elevation including gooseneck and 2" Fig 1502 Integral union at gooseneck as per rig manufacturer design.		

1.13 Vibratory Hose (For information only to provide mounting details)

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Vibratory Hose:		
1.13.1	Three (3) number 4" ID x 5 Ft, vibratory hose Grade E, 7500 PSI WP AND 11250 PSI TP with fig 1002 integral union (male & female welded) & hose hobbles (both ends). Manufactured & monogrammed according to API 7K		

1.14 Rotary Hose (For information only to provide mounting details)

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Vibratory Hose:		
1.14.1	Two (2) 4" (101.6mm) ID, 7500 PSI Working Pressure and 11250 PSI test pressure rotary hoses with 4" Fig 1002 Integral Union (Male x Female) with Safety Clamp and Chain (on both ends). Sufficient length to ensure smooth operation. Manufactured and monogrammed according to API spec 7K. (Vendor to confirm the length in technical bid)		

1.15 Tong And Hydraulic Power Tong Counter Weight

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Tong & Hydraulic Power Tong Counter Weights:		
1.15.1	Two (2) numbers of tong counterweight buckets / Wafer style mounted on mast leg & complete with guides, snatch blocks, wire lines, minimum replaceable counter weight of 10 kg each totaling 100kg for each bucket		
1.15.2	One (1) hydraulic power tong counterweight bucket/ Wafer style, guide and sheave unit, located at convenient place towards the off-drillers side with minimum replaceable counter weight of 10 kg each totaling to 200kg		

1.16 Drill Floor

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Drill Floor:		
1.16.1	One (1) set of drill floor panels with 8mm thick checkered		



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	plate for the substructure and 3/8"(10mm) thick checkered plate along the rotary area. Drill floor should be complete with handrails 1m (3'6")high with toe plates for the perimeter of the drill floor. All the checkered plates should have numbers engraved on it. Most of the drill floor panels, hand rails and floor mounting equipment to be set in to position at ground level and raised with Draw works & setback support		
1.16.2	A minimum of four (4) lifting rings/slots for each section of the drill floor panel to be provided.		
1.16.3	Outside exterior of flooring to have a 3/4" lip to contain the spillage from pouring outside of the rig floor.		
1.16.4	Rotary table to have a 2" gap around perimeter covered with bar grating for drainage		
1.16.5	Should have built in Drill floor fluid containment system.		
1.16.6	Two strong pull back post on either side of the V- door with two safety chains.		

1.17 Anti-Slip Matting

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Anti-Slip matting		
1.17.1	One(1) Set of anti-slip vinyl / rubber matting (minimum thickness 8 mm) fixed over the flooring for working area of around 3 feet (914 mm) circumferentially on floor all along the rotary table		

1.18 Rotary Setback Spreader

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Rotary/Setback Spreader:		
1.18.1	One (1) rotary/setback spreader complete with framed mouse hole opening, and recess to accommodate 6" (152mm) thick timber (or canvas reinforced rubber composite) over 3/8" (9.5mm) flat plate.		
1.18.2	Pin tabs are equipped with drop through stops (safety locks)		
1.18.3	The setback support should be designed to support at least 375 Short Ton or 700,000 lbs of racked pipe simultaneously with 650 Short Ton OR 1300,000 lbs) of casing load		

1.19 Grass Hopper And Cable Elevator & Cable Handling System / Cable Trays / Cable Boxes

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Grass Hopper And Cable Elevator :		
1.19.1	One (1) metal construction-folding grasshopper frame (of sufficient width with no cables overlapping on one another and stability) for supporting utility & cable trays to extend from top of VFD Building to substructure floor. Elevator lower laying on the ground		



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	must have covering with steel sheet to protect the cables. Separate channel along the elevator for signal cables running to avoid unwanted signal distortion problem with power cables.		
1.19.2	Grasshopper shall have sufficient cable storage area for coiling cables lying beyond cable extender towards derrick floor, if any, during rig movement.		
	Cable Handling System / Cable Trays / Cable Boxes :		
1.19.3	Grasshopper cable rack suitable for elevating with derrick floor shall be used for leading and supporting draw work and top drive cables including control, lighting, and auxiliary motor cables		
1.19.4	Grass hopper shall have sufficient cable storage area for coiling cable lying beyond cable extender towards derrick floor, during rig movement.		
1.19.5	The rig package shall be supplied with a cable extender equipped with provision for coiling additional cable required for drilling clustered location. Coiling additional cable in the cable tray shall not be permissible. Bidder to submit the design strategy of the extender.		
1.19.6	No cable will be allowed to be laid on ground outside cable tray/ rack. The cable trays shall have sufficient room for all the laid cable and the tray cover shall not touch the top layer of the cable so as to avoid any damage to the cables		
1.19.7	For mud/water tank cables, foldable type cable hangers should be mounted on mud/ water tank walls, to support the mud system cables. Suggested spacing between hangers is 1000 mm, width of the hangers is 300 mm.		
1.19.8	The cable The cable trays shall have the following specifications: The material of all the supporting structures for the cable trays shall confirm to IS: 2062-1992 Shaker plate of thickness 5 mm (minimum) with stiffeners shall be used as Top cover Separate arrangement be present to lay control cables, PROFIBUS cable, and optical fibre cables. Two numbers of earthing stud must be provided for each cable support structure. Earthing leads of steel wire with lugs are to be provided for interconnection between two Cable support stands		
1.19.9	Steel cable boxes, skid mounted, for cable storage during rig movement shall be provided. Cable boxes shall be designed for in-line arrangement. Suitable locking arrangements shall be provided with the cable boxes.		
1.19.10	The number of cable trays and cable box shall be as follows: Short Tray – 1m (L) x 1m (B) x 0.8m (H) -20 nos. Long Tray – 5m (L) x 1m (B) x 0.8m (H) -20 nos. Cable box – 5m (L) x 1m (B) x 1m (H) -3 nos.		

1.20 Mouse Hole

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Mouse Hole:		
1.20.1	One (1) Mouse hole assembly- 12" x 40' long with a		



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	stopper at 27 ft featuring spring rubber tool joint protector (including Mouse hole clamping mechanism)		
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1.21 Tool Room(For information only to provide mounting details)

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Tool Room:		
1.21.1	One (1) tool room at ODS not less than 3.66 m (12 ft) long X 2.44m (8ft) wide X 2.44m (8ft) high		
1.21.2	Tool room mounted on a 3-runner skid with load rolls		
1.21.3	Exterior side panel fabricated of 4.76mm crimped wall panels and top of skid deck covered with 6.35mm (1/4") chequered plate		
1.21.4	Tool Room should be complete with		
1.21.4.1	One(1) personnel door		
1.21.4.2	One(1) window to view well		
1.21.4.3	One(1) window to view exterior		
1.21.4.4	One(1) ladder for roof access		
1.21.4.5	Four(4) tool box along the length of tool room		
1.21.4.6	One(1) set of interior lights of FLP type		
1.21.4.7	One(1) 1.5 T split AC with industrial FLP plug socket system		
1.21.4.8	Four (4) 16 AMP spare receptacles		

1.22 Fall Arrester With Full Body Harness (For information only to provide mounting details)

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Fall Arrester With Full Body Harness:		
1.22.1	Two (2) Self retracting lifeline with 20 M (65 ft) of 3/16" galvanized cable and a fall arrest body harness		

1.23 Casing Stabbing Board

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	Casing Stabbing Board:		
1.23.1	Frame should be heavy duty, fabricated from beams.		
1.23.2	Unit to permit travel from 7 M to 14 M (23 ft to 47 ft) above drill floor.		
1.23.3	Platform should be raised and lowered by hydraulic operated chain hoist / wire line. The chain / wire-line attaches to the platform at a spring -loaded safety latch, ensuring that the safety latch engages at any loss of tension in the chain.		
1.23.4	The hoist should be equipped with a positive engaging brake.		
1.23.5	The platform should include a foot-operated latch for fixing the platform at the desired elevation.		
1.23.6	The platform and handrails should fold against the tracks when the unit is out of service.		
1.23.7	Provision for centering of different sizes of casing during casing lowering without use of man power (Vendor to specify)		



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1.24 Independent Rotary Drive System (For reference to design the substructure suitably to accommodate BHEL make IRD system. Design, Manufacturing and supply by BHEL, **Complete IRD Motor is in Bidder scope**)

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	One (1) suitable independent rotary drive for 37½" rotary table complete with AC Motor, suitable drive system, Inertia Disc Brake for IRD Component & full guard. Design of sub-structure to be compatible to accommodate BHEL make IRD system.		
	Independent Rotary Drive System : Specifications		
1.24.1	Transmission	Two speed transmission.	
1.24.2	Brake system	Disc brake	
1.24.3	Rated power	Minimum 1100 hp	
1.24.4	Cooling type	Air forced ventilation 3200 cfm @ 8 inch WC	
1.24.5	IRD AC Motor	Refer Electrical section 3.1.12.2	

1.25 High Pressure Mud Lines & Ground Manifold System For Three Pumps (Refer Fig– A below): For Information only

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	High Pressure Mud Lines & Ground Manifold System For Three Pumps:		
1.25.1	One (1) ground junction manifold consisting of seven (7) no. 4" mud gate valves of 7500 psi capacity for interchange ability of mud pump selection with suitable piping.		
1.25.2	Ground junction manifold to have Fig 1002 at one end for connecting vibrator hose from mud pumps. 4" RTJ 7500 Max WP flange at the other end for connecting HP mud lines. All flanges shall be welded.		
1.25.3	Manifold to be mounted on an oilfield type skid.		
1.25.4	One (1) 2" mud gate valve 7500 PSI tapping to be provided for misc. jobs.		
1.25.5	High Pressure Mud Lines		
1.25.6	One (1) dual 4" (127 mm) x 7500 PSI (527 kg/sq-cm) WP high mud pressure delivery system for three mud pumps as follows		
1.25.7	4" XXS (Double Extra Strong) 7500 Psi Max WP , HP lines complete with welded 7500 Psi Max WP, 4" RTJ Flanges (weld neck type) at break points upto the sub structure.		
1.25.8	HP Bends & Wing Union at one terminal end to connect vibrator hose.		
1.25.9	Two 3½" ID & length maximum 1.5m-3m vibrator hoses for connecting to standpipe (below derrick floor) with 4" delivery line pipe. Hammer union (FIG 1003, misalign type) to be provided at both ends.		
1.25.10	4" XXS HP line for dual standpipe capable of withstanding 7500 psi up to H manifold		
1.25.11	Additional intermediate 7500 PSI (527 kg/sq-cm) rated pipes with RTJ flange (weld neck type) of suitable lengths		



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	to facilitate extension of both the delivery pipes to meet the min. 60m spacing between the wells in cluster locations. The distance between two consecutive wells may be 15m approx.. The length of the pipes supplied can be a combination of 9m & 6m, measured flange end to flange end Note: The lengths of the pipes should match the spacing between the wells.		
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1.26 7500 PSI (527 kg/sq-cm) WP DUAL STAND PIPE MANIFOLD. [Refer Fig (B)]; for information only

	BHEL Requirements	Bidder's offer	Deviation from BHEL Requirement
	7500 PSI (527 kg/sq-cm) WP DUAL STAND PIPE MANIFOLD. :Choke arrangement to release pressure not required		
1.26.1	Five (5) Nos. of 4" flanged gate valves Max WP 7500 Psi		
1.26.2	Two (2) Single end 2" screwed end gate valves Max WP 7500 Psi		
1.26.3	Two (2) 4" x 4" long sweep full flow TEE (Sch.160)		
1.26.4	Four (4) 4", 7500 PSI (527 kg/sq-cm) WP misaligning union fig 1003 for standard service		
1.26.5	Ten (10) RTJ weld neck flanges 4" 7500 PSI (527 kg/sq-cm) bored for 4" SCH. 160 pipe with ring gaskets.		
1.26.6	Two (2) 4"x2" threads lets for pressure gauge and mud service connection with 2" screwed end gate valves Max WP 7500 Psi		
1.26.7	One (1) Kill line kit consisting of a suitable length of XXS pipe, swivel joints & integral unions		
1.26.8	One (1) 9.14 M (30 ft) long HP hose of 3000 Min WP with 2" Fig 1002 Integral union at each end for Hole Fill Line.		
1.26.9	Two (2) 2" 7500 PSI (351 Kg/sq-cm/527 kg/sq-cm) Plugs		
1.26.10	One (1) 0-6000-10000 PSI gauge, type D, 2" Female		
1.26.11	Y connector change over adapter (2 female 1 male) to be supplied separately.		
1.26.12	Required pipe nipples, nuts and bolts		
1.26.13	Forged reducing block Tee, 5" x 2" for cementing purpose		

DIAGRAMS OF HP MUD SYSTEM:

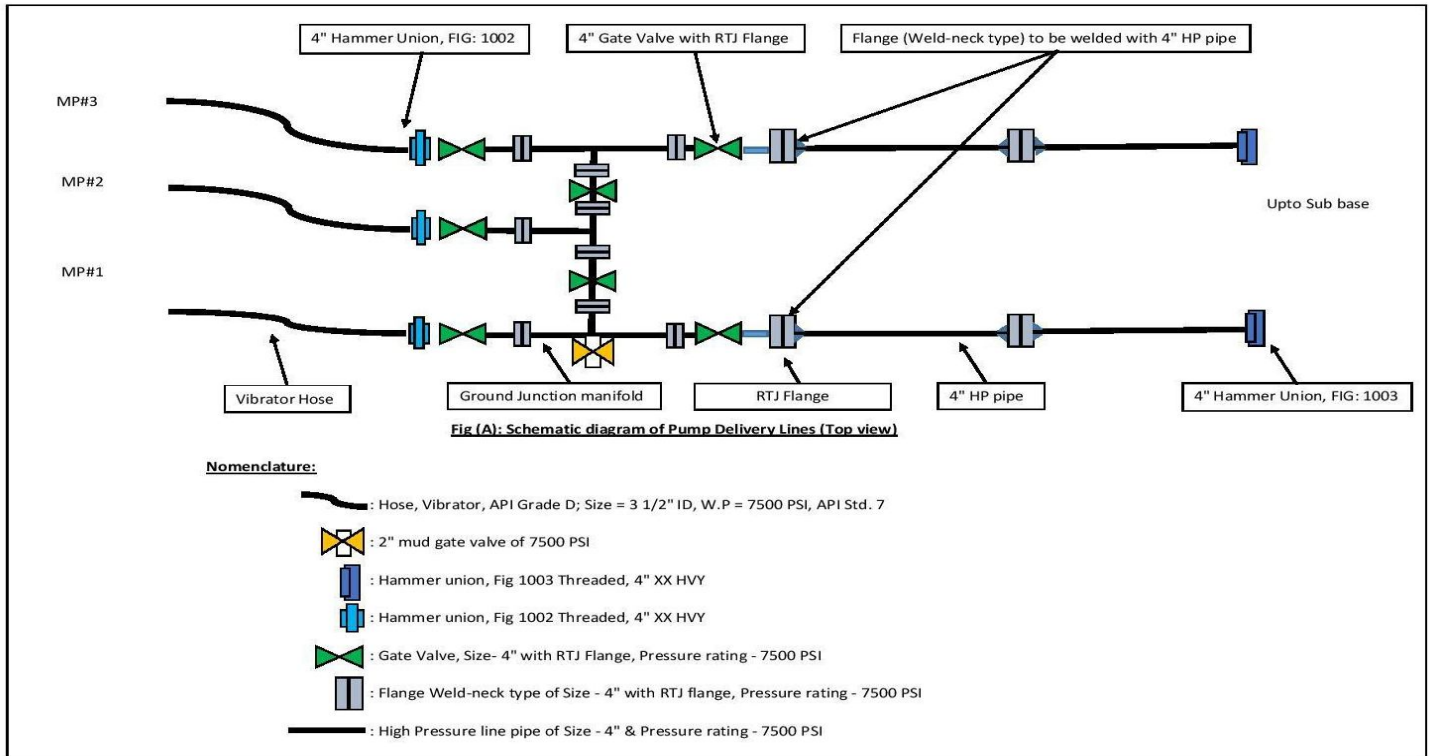


FIG A - HP GROUND MANIFOLD AND HP PIPING

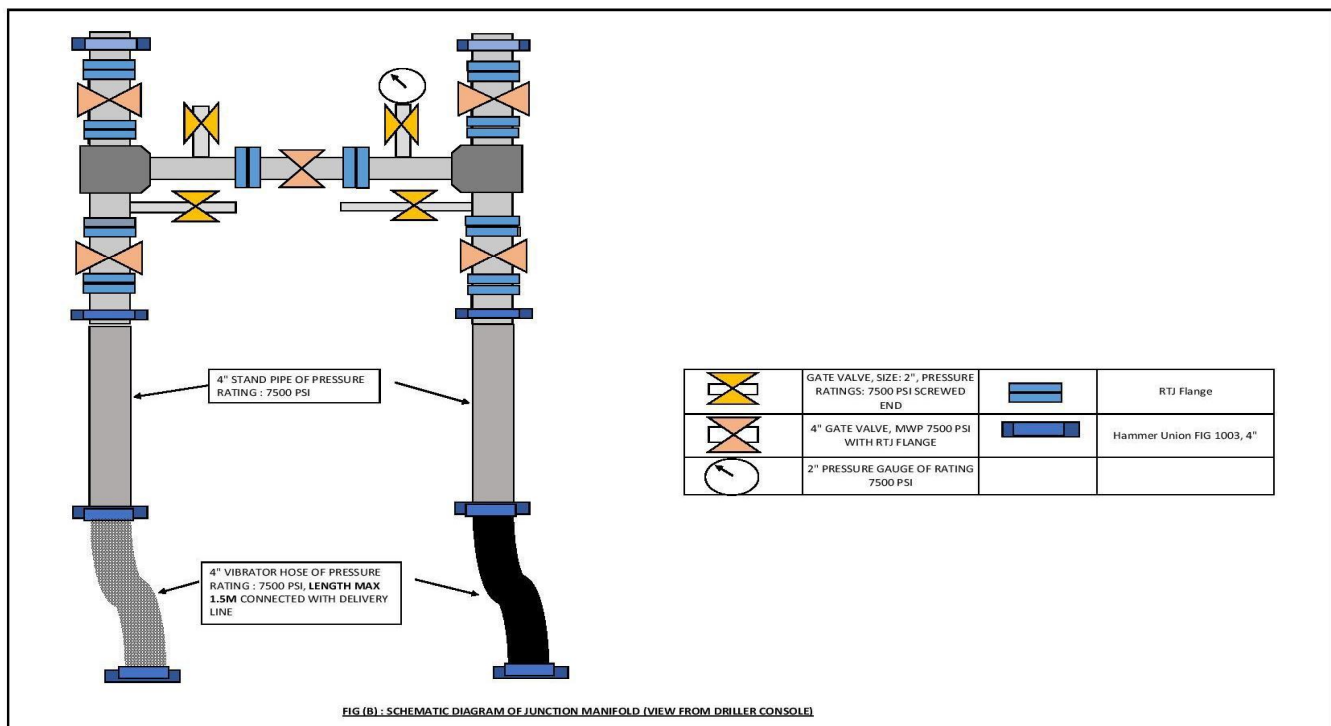


FIG B: SCHEMATIC DIAGRAM OF JUNCTION MANIFOLD (VIEW FROM DRILLER CONSOLE)



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Design and Documentation of Mast, Substructure, Crown Block and accessories shall include but not limited to the following:

1. Supply of Design documentation as per section 3.1.1 meeting Cl. 5.4 of API-Q1 and total API-4F (5th edition)
2. Supply of Design calculations including calculations of critical welds/components.
3. Supply of Design Source File (STAAD file), Supply of file and software if other than STAAD
4. Supply of Design and Development records as per API Q1 & 4F (5th edition)
5. Supply of Complete Manufacturing drawings in Auto CAD with detailed BOM.
6. Supply of Purchase specification for components or subassemblies to be outsourced.
7. Supply of Raw Material Purchase Specifications
8. Supply of Assembly drawings
9. Supply of Assembly sequence and Rig-up & Rig-down procedures
10. Supply of Soil Bearing/ Base pressure Diagram
11. Supply of O&M Manual
12. Supply of any other information required by BHEL and/or end customer for carrying out manufacture of hydraulically raised Mast & Substructure at BHEL- Hyderabad facility and operation by end customer.
13. Supply of load test procedure for Mast at rated hook load capacity

Notes:

1. Vendor to design the Mast, Sub-structure and crown block and other accessories preferably with steel profiles readily available in India.
2. Vendor to provide details of all the BOI's used in M&SS
3. Complete design package as defined by API-Q1 and to be meeting Cl. 5.4 of API-Q1 and total API-4F latest edition.
4. Documentation to include Detailed design calculations, spreadsheets, hand calculations, welding design (meeting AWS D1.1).
5. Output documents to include drawings in AutoCAD format with detailed BOM, 3D model of total structure preferably in Tekla structures. (If 3D models and other drawings of different software, vendor to supply software also)
6. Design shall be validated and approved
7. Substructure to be compatible to BHEL make Independent Rotary Drive system.
8. Mounting provision for IRN (Including design)
9. Mounting location and provision for Air winches for 1. Racking board, 2. Man rider and 3. Drilling use.
10. Sub-structure should be compatible for Rig walking system (Of any reputed make preferably NOV) with full setback (pipes racked on the floor) for pad drilling.
11. Following minimum equipment (but not limited to) to be considered while designing Mast & Substructure.
 - a. 2000 HP AC Draw-works
 - b. 500 Ton AC Top drive
 - c. Iron Roughneck (ST-100 or equivalent)
 - d. Hydraulic catheads
 - e. Drillers control cabin and ODS tool room
 - f. IRD system
 - g. Air winches
 - h. Any other equipment which comes in Mast & sub-structure as per bidder's standard design.



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3.1.2. HYDRAULIC BOP CART

Scope of Bidder and BHEL Hyderabad for manufacturing of Hydraulic BOP Cart. Bidder to confirm:

SL. NO.	BHEL SCOPE	Bidder's SCOPE	Bidder's Response
01	1. Main fabrication, assembly and testing of Hydraulic BOP Cart. 2. Procurement of direct bought out items including all the hydraulic cylinders.	1. Supply of all hydraulic components and controls. This includes but not limited to, manual control, Wireless Controls, encoders, sensors and hydraulic Motors. 2. Supply of complete manufacturing documentation (Drawings in Acad format, Technical process sheet, Schedule of Parts, Material Purchase specifications, Inspection & Test Procedure & O&M manual) for manufacturing, assembly and testing of BOP cart at BHEL works. Documentation required is detailed at the end of the Technical specs, Section-3.1. 3. Supervisory support for manufacturing, assembly and testing at BHEL works	

BOP Handling System (BOP Cart): One (1) No.

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	BOP Handling System (BOP Cart): One (1) No.		
2.1	Hydraulically operated BOP Handling system of capacity 75 Ton		
2.2	Enable the BOP stack to be moved, tested and set at well centre without breaking down the stack		
2.3	It raises a horizontally stored BOP stack to vertical and align it to existing wellheads. This includes 1/2 degrees over-rotation on the tilt, up to 36" of vertical travel to match wellhead elevations, over +/- 3" of transverse misalignment correction and up to 18 degree rotation of BOP to align wellhead bolts		
2.4	It allows easy and rapid connection, support, and disconnection of the BOP from the frame when desired. The attachment collar clamps are pivoted and fastened with standard T-bolts		
2.5	The empty BOP transport cart is short enough to remain beneath the drill floor while drilling, if desired		
2.6	Steel track sections provide support and alignment between the base boxes and well centre allowing the BOP transport cart to be hydraulically driven to or from well centre with standard track		
2.7	The BOP Transport system can easily lift the BOP up over wellhead studs, tilt to a horizontal position, and		



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	travel out from beneath the drill floor for tail boarding on to a truck or lifting with a crane for rig moves. Lift points for both crane and tailboard handling are provided		
2.8	The BOP transport cart holds and protects the BOP in a horizontal position for truck shipping. BOP cart design criteria support 2G in any direction with the stack in a horizontal position		
2.9	BOP Lift Frame is designed to be easily clamped to the specified BOP stack, and it supports the stack vertically and horizontally on the cart. The topmost clamp mechanism fit immediately below the annular preventer base and takes the vertical loads of the entire stack. A rotating steel plate is immediately below the annular preventer that uses simple push/pull hydraulic cylinders to rotate the BOP by 9° either direction. The rotating plate is drilled for grease zerks and surface grooved to facilitate greasing to reduce rotational loads		
2.10	The two lower clamps are designed for fast attachment to the BOP by swinging hinged arms across the back of the BOP and fastening with load binders. The BOP Lift Frame can be adjusted over a range of 0" to 42" in 6" increments and has a hydraulic lift of 36". This allows the base of the annular to be positioned from 11' - 7" to 18' - 1" above the base of the rig. The large adjustable range allows many BOP configurations to be chosen		
2.11	The Tilt Frame guides the Lift frame when the BOP/lift frame is picked up off a wellhead and titled back 90 deg. to a horizontal position. Twin double-acting multi-stage cylinders perform the tilting function. A half degree over-stroke is provided for out of level conditions		
2.12	Counterbalance valves are attached to the tilt and lift cylinders to control movement in case of any hydraulic failure		
2.13	The tilt frame is sized to allow horizontal movement of the BOP/lift frame with the lift cylinders when the tilt frame is horizontal. This moves the CG location for lifting purposes		
2.14	The Handling Cart is a hydraulically driven cart in which BOP lays horizontally for shipping. It also supports the BOP and tilting mechanism to rotate the BOP to vertical and locate the stack over a wellhead		
2.15	The steel wheels are recessed to allow direct loading on truck beds. Additional lift frame supports are built into the cart to spread the BOP weight between the frame or wheels		
2.16			



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	Four lifting lugs are built into the cart for easy crane picks		
2.17	The hydraulic control console is located on the side of the cart that is powered by the rigs HPU		
2.18	The track sections are designed to support the BOP Handling cartloads and are braced off the existing sub bases. The centre track section is about 36 feet long and projects about 5 feet aft of the well centre. The BOP can be left attached to the transport cart or the lifting frame can be unpinned from the stack, lowered, and the cart stored beneath the drill floor		
2.19	BOP Transporter capable of remaining pinned to the substructure base boxes while walking.		
2.20	Above specification gives broad guidelines to the vendor to submit offer. Vendor to quote with all technical details		

3.1.3. AC MUD PUMP

Scope of Bidder and BHEL Hyderabad for manufacturing of AC Mud Pump. Bidder to confirm:

SL. NO.	BHEL SCOPE	Bidder's SCOPE	Bidder's Response
01	1. Main fabrication, assembly and testing of AC Mud Pump. 2. Procurement of direct bought out items.	1. Supply of mud pump components covered under API-7K (Liners, Pistons, valve seats). 2. Supply of One-piece forged steel crankshaft, with press fitted and keyed crank shaft lobes 3. Supply of Drive Motors (Same make as provided in Draw works). 4. Supply of complete manufacturing documentation (Drawings in Acad format, Technical process sheet, Schedule of Parts, Material Purchase specifications, Inspection & Test Procedure & O&M manual) for manufacturing, assembly and testing of AC Mud Pump at BHEL works. Documentation required is detailed at the end of the Technical specs, Section-3.1. 5. Supervisory support for manufacturing, assembly and testing at BHEL works	

Mud Pumps - 1600HP: 3 No's

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Mud Pumps - 1600HP : Three (3) No's		



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	Three (3) Nos. 1600 HP (1193 kW) rated Input Horse Power, Triplex Single Acting, Horizontal Piston Slush Pump /Mud Pump package, unitised with suitable VFD Motors, dual rear mounted, banded V-belt drive, with other necessary accessories, skidded and master skidded (Pump skid should be securely fastened on an oilfield type master skid) with following specifications:			
3.1.1	Slush Pump, Triplex Single Acting, Horizontal Piston Pump with individual 2(two) piece "L" shaped (separate) interchangeable forged alloy steel Modules and replaceable cylinder Liners of various sizes viz. 7"-7 ½ ", 6"- 6 ¾ " & 5 ¾"- 4 ½ " etc diameter to obtain desired discharge and pressure at rated SPM, having double relieved herringbone crankshaft and a pinion shaft gear. The pump must be driven by dual end mounted suitable electric Motor with banded V-belt drive, complete with standard accessories mounted on an oil-field type minimum 3(three) runner skid, skidded on a master skid for on shore Drilling Rig. (The pump skid should be securely fastened on oil field type master skid)			
3.1.2	Mud Pump Capacity			
3.1.2.1	Rated max. input HP	1600 HP (1193 kW) at rated SPM.		
3.1.2.2	Stroke Length	11-inch (Min.)		
3.1.2.3	Discharge (approx.)	Discharge at rated SPM with replaceable liners and pistons - Min. 2914 litres/min (770 US GPM) at 225 kg/cm ² (3200 PSI), and min. 1124 litres /min (297 US GPM) at 527.2 kg/cm ² (7500 PSI).		
3.1.3	Pump Features			
3.1.3.1	Fully enclosed fabricated steel plate (ASTM A-36 or equivalent) power end.			
3.1.3.2	Double relieved forged alloy steel Herringbone (double helix) type main gear.			
3.1.3.3	One piece Forged steel double extended pinion shaft with double helix gear			
3.1.3.4	One piece forged steel crankshaft, with press fitted and keyed crank shaft lobes. Bearings of the pump must be of make Torrington/SKF/FAG/NTN/ARB/Timken/Schaffler.			
3.1.3.5	Provision for manual rotation of the crankshaft externally for maintenance purpose.			
3.1.3.6	Individual separate, forged alloy steel (AISI 8630 / 4130 /equivalent), autofrettage, and completely interchangeable fluid end modules having separate valve pots (API MOD.7) in each module (for both suction & discharge).			



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3.1.3.7	Fast change type screwed valve covers		
3.1.3.8	Two-piece design fast change piston rods with clamp.		
3.1.3.9	Three inlet suction manifold with suction stabilizer or suction dampener assembly and Discharge manifold with discharge pulsation dampener.		
3.1.3.10	Piston-Liner Cooling/spray system that includes A.C. 3PH, 50 Hz. Flame proof (Ex-d type) with IP55 protection & insulation type B electric motor suitable for use in hazardous area classification Zone-I, gas group IIA & IIB; suitable Centrifugal pump for liner spray; cooling/ lubricant reservoir with suitable piping connection.		
3.1.3.11	Pump fitted with liners (API 7K) held rigidly in place with a two-bolt retention clamp/adaptor nut, premium pistons, valve seats (API 7K), centre guided valve with polyurethane insert.		
3.1.3.12	Crankcase Lubrication system should be splash type and/or forced lubrication.		
3.1.3.13	Suction connection should be 10" (250mm), ASA-150 with 10" 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 (10 inch) of each Mud pump with 10" Butterfly suction valve.		
3.1.3.14	Discharge modules should be interconnected so as to make a smooth discharge flow through strainer cross; 5" API 7500psi, R.J. Flanged (screwed type) on one end and provide valve & bleed line connection on the other end.		
3.1.3.15	Pump sheaves should be compatible for Gates 8-8VP-3150 heavy duty V-belt.		
3.1.3.16	The pump should be complete with all the components of fluid end and power end, mounted on a sufficiently strong skid (base skid) skidded on another oil field type skid (mother skid) having standard design for self-loading at both ends and base skid should be strongly anchored with the main pump skid (mother skid). The total length of skid should not be more than 7600mm. There should be proper lifting arrangement on the pump also.		
3.1.3.17	Detailed technical drawing of the base skid and mother skid are to be submitted along with the offer for our approval. Detailed GA drawing of the pump set along with dual rear mounted motors, pump drive and their accessories are to be submitted along with the offer.		
3.1.3.18	The dimensions of the complete pump with mother skid should be within 7600 mm long x 2900 mm wide x 2500 mm height and the total package weight must not exceed 35000kg (Refer section 11.1 for details.). Justification is required if the above limiting dimensions cannot be met.		
3.1.3.19	One complete valve seat puller assembly suitable for above mentioned valve seat and one set of special hand tools for fluid end maintenance (i.e valve pot tool, wrench for valve cover, for studs on the		



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	hydraulic cylinders, strainer cross & discharge pulsation dampener etc) must be included with pump set to be supplied.		
3.1.3.20	One no tool for manual rotation of the pump for maintenance. Refer C (e)		
3.1.3.21	2 No. additional belt for pump set to be supplied along with the pump. The belt make and size should be same as offered with the pump.		
3.1.3.22	Suitable analogue type belt tension meter & belt alignment meter with complete operation & maintenance manual, 1 No.(set) with each pump to be supplied.		
3.1.3.23	Suitable Stroke Counter Meter should be mounted on each pump locally.		
3.1.3.24	A suitable fixture (s) to be provided (may be fitted on pump skid) for assembly/ disassembly of Piston assembly & Valve assembly.		
3.1.3.25	Each mud pump package should be assembled with the following accessories:		
3.1.3.26	One (1) Discharge Strainer Cross Assembly complete with suitable strainer (Left side when viewed from Fluid end). Refer Fig (C) SECTION 4.7		
3.1.3.27	5"-7500 psi (527.2 Kg/sq. cm) Max. WP Discharge flange RJ connection with weld neck (4.063"/104mm bore) welded to integral forced steel reducing elbow (MW.P. 7500 psi) of minimum 135 degree. HP 4" delivery line from Discharge Flange to ground (by using elbow of minimum 135 degree as mentioned above) to be connected to 3 ½" Vibrator hose which ultimately to be connected with ground junction manifold (by using Wing union 4" FIG1002 ,welded type) 4inch (103 mm) x 7500 PSI (527 kg/sq-cm) WP welded type gate valve connected to mud pump delivery with fig 1002 union.		
3.1.3.28	5"-7500 psi (527.2 Kg/sq cm) MWP flange RJ connection with 2 inch internal API LP thread for Pressure Gauge with 2"fig 1002 wing union and isolating valve (make OTECO/DEMCO)&one (1) extra 2" opening with high pressure plug to connect Drillo-meter		
3.1.3.29	4"- 7500 Psi (527.2 Kg/sq. cm) MWP RJ Flange top connection with studs and nuts for Pulsation Dampener.		
3.1.3.30	5" -7500 Psi (527.2 Kg/sq cm) MWP RJ Blind Flange End Connection for Strainer Clean-out with lifting eye (to be fitted perpendicular to centre line of the pump) for ease of servicing with a safety chain.		
3.1.3.31	One (01) No. 3" Bleed line from HP TEE connection (at the end of the delivery manifold) to mud tank with 3" HP valve, suitable to handle 7500 PSI MWP. The bleed line should be connected to the 3" HP valve with 3" HP fig 1002 wing union having compatible line & fittings. Refer Fig (D)SECTION 4.7		



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3.1.3.32	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		
3.1.3.33	Three (03) Nos. Vibrator hose, API Grade-D, 4 inch Nipple API LP Threads (external) both end, MWP 7500 psi as per A.P.I. Std.7 for connecting Three (03) Nos. mud pumps to the ground junction manifold complete with Fig 1002 wing union on either ends		
3.1.3.34	One (1) Discharge Pulsation Dampener (Make-HYDRIL Model- K-20-7500 or equivalent), maximum service pressure 7500 PSI (527.2 Kg/sq cm), surge capacity 75 Litres (20 gallons). Connections - 4" (100 mm) API 7500 RTJ, Diaphragm – Hydrogenated Nitrile or equivalent.		
3.1.3.35	One (1) Pressure gauge on each pump (Make-OTECO/CAMERON), 0 - 10000 PSI range with 2" (50 mm) line pipe female connection, and there should be provision to isolate the gauge with a 2" (50 mm) flex seal valve (Make- OTECO/DEMCO)		
3.1.3.36	One (1) Manual reset (Type-B) relief valve, 3" (75 mm) manual reset 1500 – 7500 PSI WP (Make-OTECO/NOV).		
3.1.3.37	Suitable external gear pump for circulating lube oil if any		
3.1.3.38	External closed circuit liner flushing mechanism		
3.1.3.39	One (1) Charging hose assy. for pulsation dampener		
3.1.3.40	One (1) Jib crane with trolley installed on each pump to handle fluid end parts		
3.1.3.41	One (1) Yale hand hoist, 1/2 ton LH 8 Ft lift for use with Jib Crane		
3.1.3.42	Emergency Stop Switch with locking & Indication system on Mud pump skid		
3.1.3.43	LED Lighting system.		
3.1.3.44	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.		
3.1.4	Double earthing system of main motors and all auxiliary motors with suitable size of GI strip earthing with MP skid. Refer to 9.8.1 of electrical section for detail earthing specifications.		
3.1.4.1	Mud Pump Walkway		
3.1.4.2	Working platforms around mud pump & approach walkway to Mud cleaner & Desander feed pump to be provided		
3.1.4.3	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		



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	(Fluid end side)		
3.1.4.4	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		
3.1.4.5	One tool storage box of dimension 4 X 1 X 1m with four legs of 80cm to be provided with each rig.		
3.2	<u>PUMP DRIVE AND MOTOR SKID</u>		
3.2.1	Dual rear mounted electric motor drive along the length of the pump for the offered Belt driven mud pump, including extended skid frame, motor supports, to be mounted on the master skid. (Refer to 3.1.12.4 & 3.1.12.5 of electrical section for detail motor specifications)		
3.2.2	Pumps are to be fitted with suitable pulley (including hub) on both sides of pumps, and shall be connected with banded/ ribbed V belts and guard in case of belt drive.		
3.3	<u>PUMP DRIVE MOTOR [For details, refer Section 3.1.12]</u>		
3.4	<u>BLOWER MOTOR ASSEMBLY</u>		
3.4.1	3 phase, 415 or 400V, 50Hz AC Induction motor, of suitable rating as per motor OEM design. Ducting should be of steel sheet, with mesh filters. Refer to 3.1.12.6 & 3.1.12.7 of electrical section for detail motor specifications.		
3.4.2	Terminal box – Blower Motor shall be fitted with double compression type FLP cable gland of suitable cable OD.		
3.5	<u>MUD PUMP MANDATORY SPARES</u>		
	Mud Pump mandatory spares Per Rig (Consumables).		
	The following mandatory spares shall be included in the scope of supply.		
3.5.1	Liner (any one size) 7" / 7¼" / 7½"	42 Nos.	
3.5.2	Liner (any one size) 6" / 6¼" / 6½"	24 Nos.	
3.5.3	Piston Assembly (any one size) 7" / 7¼" / 7½"	54 Nos.	
3.5.4	Piston Assembly (any one size) 6" / 6¼" / 6½"	42 Nos.	
3.5.5	Piston Rod complete	06 Nos.	
3.5.6	Suction Module	01 Nos.	
3.5.7	Delivery Module	01 Nos.	
3.5.8	Valve Seat	48 Nos.	
3.5.9	Valve assembly with polyurethane insert	100 Nos.	
3.5.10	Valve insert (polyurethane)	200 Nos.	
3.5.11	Valve spring	48 Nos.	
3.5.12	Valve cover gasket	200 Nos.	
3.5.13	Liner gasket, (any one size) 7" / 7¼" / 7½"	90 Nos.	
3.5.14	Liner gasket, (any one size)	90 Nos.	



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	6"/6¼ "/6½"			
3.5.15	Wear plate gasket	12 Nos.		
3.5.16	Wear plate	06 Nos.		
3.5.17	Studded Fluid End	03 Nos.		
3.5.18	Banded power belt left and right	02 Nos.		
3.5.19	Pulsation Damper repair Kit	04 Nos.		
3.5.20	Valve seat puller	01 No.		
3.5.21	Lube Oil Pump Assembly	01 No.		
3.5.22	Flushing Pump Assembly	01 No.		
3.5.23	Lube oil Filters	03 Nos.		
3.5.24	Ring Gasket for Suction, Discharge Manifold and Pulsation Dampener	01 Set.		
3.5.25	Stroke counter meter (To be confirmed by Cementing)	02 No.		
3.5.26	Belt tension meter (analogue)	01 No.		
3.5.27	SRV	01 No.		
3.5.28	Special Tools for fluid end & pulsation dampener maintenance	01 Set.		
3.5.29	Hydraulic jacks for liner fitment and removal (required as per OEM design)	03 Nos.		
3.5.30	Pulsation Dampener of (Make- HYDRIL Model- K-20- 7500)	01 No.		
3.5.31	Cross Piece	01 No.		
3.5.32	Infrared thermometer	01 No.		

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. PLEASE TICK MARK 'YES' OR 'NO' TO THE FOLLOWING QUESTIONS, IN THE RIGHT HAND COLUMN

SL No.		Remarks	
3.7.1	Whether quoted as OEM of Pump and whether documentary evidences submitted to this effect?	YES/NO	
3.7.2	---	YES/NO	
3.7.3	Whether quoted as Authorised Dealer of OEM (Pump), if so, has the dealer submitted documentary evidences in this regard?	YES/NO	
3.7.4	Whether the Pump offered is rated for continuous operation at full load?	YES/NO	
3.7.5	Whether the offered pump design is of two piece Module?	YES/NO	
3.7.6	Whether the input HP of the Pump set 1600 HP to obtain the desired Hydraulics as per our NIT.	YES/NO	
3.7.7	Whether the pump offered having double helical (herringbone) main gear & pinion shaft with double helix gear?	YES/NO	



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3.7.8	Whether the offered Mud pump sets are skidded on a master skid?	YES/NO	
3.7.9	Whether the Mud pump is equipped with belt driven system as asked for?	YES/NO	
3.7.10	Whether auxiliary motors are flame proof and suitable for use in hazardous area?	YES/NO	
3.7.11	Whether detail specifications of Pump along with technical literature / catalogue /schematic layout (plan & elevation) of the pump offered enclosed with the offer?	YES/NO	
3.7.12	Whether spare parts for the offered pump will be available for next 15 years from	YES/NO	
3.7.13	Whether 3 sets of part list with part numbers, quantity and unit rate recommended for two years of operation are submitted along with the bid?	YES/NO	
3.7.14	Whether separately highlighted any deviation from the technical specification sought for?	YES/NO	
3.7.15	Whether Test Certificates of Pump will be submitted along with the supply?	YES/NO	
3.7.16	Whethers parts & Special tools for the pumps mentioned will be supplied?	YES/NO	

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. 2000 HP AC DRAW WORKS

AC-E-2000HP DRAWWORKS: One (1) No.

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	AC-E-2000HP DRAWWORKS :One (1) No.		
	One (1) 2000 HP AC variable frequency drive (VFD) Draw-Works conforming to API 7K with under-noted features /specification		
	Primary/dynamic braking to be performed with AC motors by dissipating power into braking resistors. The motor and frequency drive should be capable of holding full load at zero speed. Load and speed is limited within motor capacity by the control system.		
	A pneumatically operated multi-plate disc brake system should be provided for parking and emergency situations; consisting of multi-plate water/air cooled discs with spring applied brake, static braking by springs expanding & forcing all the brake discs together (fail safe). The brake assembly is to be mounted to the end of the drum shaft & secured to the drum support uprights.		
	This multi-plate disc brake system should be operated remotely via the draw-works control system. Emergency brake controls on the draw-works should allow the load to be manually lowered using the multi-		



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	plate disc brake system.			
	Bidder to confirm the position of draw works (Bidder to refer section-3.5 for weight of the draw works so that draw works can be transported as a single unit with disc brake)			
Draw works Specification & Feature				
4.1	Rated Horsepower	2000 HP minimum		
4.2	Drive motors	Two AC cage VFD induction motors, each of minimum 1100 HP continuous and 1400 HP intermittent rating explosion proof rating. Details at Section 3.1.12.1 (Draw works motors)		
4.3	No. of Drums	One		
4.4	Drum size	30"X 55" or above		
4.5	Grooving	Lebus Type grooved for 1 ½" wire line		
4.6	Hoisting Capacity (min)	500 Short Ton (454 MT or 1000,000 lbs) with 12 lines @ 4 th layer		
4.7	Transmission	Direct gear drive		
4.8	Auxiliary brake	One, 38"-60" diameter water/air cooled Disc brake with locking device		
4.9	Main brake	Dynamic Type Braking System		
4.10	Crown & floor saver	Electronic systems for preventing accidental hitting crown block and rig floor by the travelling block and pneumatic Crown- O-Matic type crown saver system with proximity sensor integrated with drilling control software. Mechanical arrangement for crown saver in addition to electrical arrangement will be preferred (toggle valve).		
4.11	Lube system	Two (2) Lube oil pump with motors (3HP, 415 or 400V, 3 Ph., 50Hz) along with oil filtering and cooling system		
4.12	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."



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3.1.5. 500T AC TOP DRIVE

500 Ton Portable Top Drive System (TDS): One (1) No.

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	500 Ton Portable Top Drive System (TDS) :One (1) No.		
5.A	500 short Ton Top Drive System (TDS): Components		
5.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		
5.A.2	Forced Air-cooled Motor and Gear Box cooling system.		
5.A.3	Guide beam system (As per Rig Manufacturer design).		
5.A.4	Remote controlled pipe handler assembly		
5.A.5	Counter balance /weight compensating system		
5.A.6	Integrated Top drive Driller 's console for all functions of TDS		
5.A.7	Complete power cable, control cable and junction box		
5.A.8	Integrated Electrical control system		
5.A.9	Mud goose neck		
5.A.10	Mud hose of required length – 2 nos. Details at clause no. 1.14 (Rotary hose) under section 3.1.1		
5.A.11	Drag Chain System for TDS cables and hoses		
5.A.12	IBOP shall be provided with TDS along with software integration with drilling control system		
5.A.13	TDS has to be compatible with online monitoring system		
5.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) .		
5.A.15	Top Drive Hydraulics to be taken from rig central HPU.		
5.B	500 Ton Top Drive System (TDS): Specification		
5.B.1	Drive Motor: AC Motor(s) of minimum total capacity of 1100 HP, non-sparking. Flame proof and suitable for hazardous locations. The motor speed control is with variable frequency drive that includes the Converter, power modules & necessary controls. Detail at Section 3.1.12.3 (Top drive motor)		
5.B.2	Torque and Speed		
	Continuous Torque	50,000-56,000 ft-lbs (minimum) at 90 or above RPM	
	Torque at Max. Speed	20,000 ft. lbs (minimum)	
	RPM range	0 - 220 RPM (minimum)	
	Break out torque	75,000 ft. lbs (minimum)	
	Tubular Range	2-3/8" – 6 5/8".	
5.B.3	Hoisting & Rotating	500 Short Ton.	
5.B.4	Water Course	3 In.	
5.B.5	Pressure Rating	7500 psi	
5.B.6	Upper IBOP	15000-psi WP with hydraulic remote actuator	
5.B.7	Lower IBOP	15000 psi WP with saver sub (bottom connection 4 ½- IF Pin)	



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5.B.8	Mud goose neck fitted with hammer union to suit fitting of rotary hose with 4" Fig 1002 Number hammer union, with a 2 or 3 inch Top port for emergency wire line operations			
5.B.9	Wash pipe should be of easy replacement type without hammering			
5.B.10	Lubrication	Force fed, Filtered, Air Cooled		
5.1	Electrical Package			
5.1.1	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. 415 or 400 Volts, 3 phase, 50 Hz, Suitable power rated, TEFC motors, flameproof, shall power drive Motor cooling Blowers and hydraulic pump motor.			
5.1.2	Electrical Control system (including VFD Drives) of TDS may be accommodated in the common Power Control Rooms or in a separate Power Control Room (Without increase in total size of VFD house). For details refer Electrical Section: 3.1.6 (Power Control Room).			
5.1.3	The top drive cables shall preferably be laid along the off-Driller side Mast structure to facilitate handling (laying /dismantling) of cables during Rig Up/ Rig Down. The Top drive cable joint (on the mast) shall be placed such that rig up of the top drive cable can be done before mast up (i.e with the mast in horizontal position). If any in-line joint is provided on the top drive cables, the same shall be of Ex-d type.			
5.2	Carrier Package			
5.2.1	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.			
5.3	Pipe Handler Package			
5.3.1	Also to include in the package are one Upper IBOP valve, one Lower IBOP valve and two Saver Sub for an NC50 API RH tool joint complete with Locking Rings for the API 6-5/8" Reg connections			
5.3.2	The Clamping Mechanism can be positioned to provide Back-Up for removal and installation of the Saver Subs, Lower IBOP Valve and Upper IBOP Valve. The package to be configured with IBOP Valves with H2S Trim and for use with 350 /500 Ton Elevator Links			
5.4	S-Pipe Package			
5.4.1	Package should include a 7500-psi capable S-Pipe with 20 degree elbow. The connection for the Rotary Hose			



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	shall be a female, 4-inch Fig 1003 Union. Pressure rating of the package, as assembled at the factory, shall be 7500 psi. The Rotary Hose connection shall be on the Right Hand side of the TDS (viewing TDS from the front) and positioned toward the front of the TDS		
5.4.2	The Elbow shall have an upper connection to the S-Pipe that is a Fig 1003 Union with the Female half being on the S-Pipe. The Elbow can be removed to have a 4" Female Fig 1003 Union pointing straight down for connection of the Rotary Hose directly to the S-Pipe		
5.5	CASING RUNNING TOOL (For information only)		
5.5.1	Hoist and Torque Tool		
5.5.2	Adjustable Link-Tilt Frame		
5.5.3	Pipe Weight Compensator		
5.5.4	Pipe Sensor		
5.5.5	Single Joint handling assembly (Hydraulically operated single joint elevator, cylinder assembly for link tilt / Link tilt assembly, frame for housing the components)		
5.5.6	Hydraulic / Air Swivel		
5.5.7	Fill up and Circulating Tool		
5.5.8	CRT Monitor		
5.5.9	Hydraulic Controls and Hydraulic Power Unit		
5.5.10	Hoist and Torque Tool		
	SPECIFICATION		
5.5.11	Hoist Rating (API 8C)	500 short ton	
5.5.12	Casing Size	4-½" to 9-7/8"	
5.5.13	Fill Up and Circulation	4.1/2" to 9-7/8" Fill p & circulation	
5.5.14	Maximum Circulation Pressure	5000 psi	
5.5.15	Rotational Speed	0 – 20 RPM	
5.5.16	Maximum Push down Force	5,000 psi / 34,500 kPa 5,000 psi for 4-½" to 5-½" casing 4,000 psi for 7" casing 2,000 – 2,500 psi for 9-5/8" to 9-7/8" casing	
5.5.17	Maximum Torque	35,000 ft-lbs.	
5.5.18	Compensator Capacity @ 90 psi air supply	8,500 lbs (3,900 Kg)	
5.5.19	Link Tilt out distance	15 FT (4.5m)	
5.5.20	Shaft Connection	NC50 (4-½" IF) API RH Box Or 6-5/8" Reg API RH Box with cross over to 4-½" IF API RH Box	
5.6	Bail Package		
5.6.1	Package should include an API 500T Swivel Bail, Bail		



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	Pins with retaining devices, Bail Pin Bushings and Counterbalance Cylinder Mounting Brackets		
5.6.2	All components should be factory installed on the TDS		
5.6.3	Bail to be used for direct coupling to a Travelling Block		
5.7	Shipping Package		
5.7.1	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.		
5.8	Tool Kit		
5.8.1	Special tools and accessories required for the installation, commissioning and testing, dis-assembly and operation shall be supplied with the TDS		
5.8.2	Package shall also include a Lower IBOP Hex Wrench, Valve Seat Wrench and Valve Seat Puller, along with a NC50 Saver Sub, a Spacer Sub and a Cross-over Sub for use during well-control procedures		
5.8.3	Includes TDS gear box lubricant, hydraulic system fluid and hand pump for standard service.		
5.9	U-BOLTS & CLAMP For 350 TON & 500 TON ELEVATOR LINK		
5.9.1	Set of U-Bolts for accommodating 350 Ton and 500 Ton capacity Elevator Links		
5.9.2	Clamp for accommodating 350 Ton and 500 Ton capacity Elevator Links		
5.10	WELDLESS LINKS (API Monogrammed: API Spec. 8C)		
5.10.1	One (1) pair of 350 Short Ton (317 MT) Capacity Weld less Links, 2-3/4" x 168" (70 mm x 4267 mm)		
5.10.2	One (1) pair of 500 Short Ton (454 MT) Capacity Weld less Links, 3-1/2" x 168" (89 mm x 4267 mm)		
5.10.3	One (1) pair of 250 Short Ton (226 MT) Capacity Weld less Links, 2-1/4" x 168" (57 mm x 4267 mm)		
5.11	Mandatory Spares		
5.11.1	Wash pipe assembly & TDS saver sub with Five (5) sets of packing		

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.



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3.1.6. VFD HOUSE FOR 2000 HP RIGS

3.1.6 POWER CONTROL ROOMS (PCR):

Power control room (PCR) 1, 2 & 3 shall house the main Variable Frequency Drive panels, control panels for main drives, auxiliary motor panels, Generator control panels, Dynamic brake control panels, Programmable Logic Controller (PLC) /Single Board Computer (SBC) / Programmable Automation Controller (PAC) panel etc. Power Control Rooms (PCR 1, 2 & 3) shall be manufactured at BHEL Bhopal works and items which shall be in BHEL scope and Bidder scope are listed in table A & B below. Balance items to complete the manufacturing of PCR 1,2&3 shall be in the scope of supply of bidder for final assembly & testing at BHEL Bhopal.

A. Following items shall be in the scope of BHEL Bhopal for manufacturing of PCR 1, 2 & 3

SL. NO.	Main equipment / items	BHEL SCOPE	Remarks	Bidder's Response
01	Fabricated PCR house shell for PCR 1, 2 & 3.	Manufacturing / Procurement	Bidder to provide detailed design, drawings and manufacturing & testing documents as per tender details to enable BHEL to manufacture the PCRs including all information upto final inspection.	
02	415 VAC MCC Panels for PCR 1, 2 & 3 including Soft starters & NGR	Manufacturing / Procurement	Design information of MCC panels with NGR to be provided by bidder with dimensional Layout in the PCRs to enable BHEL to source MCC panels locally in India.	
03	750 KVA Transformers for MCC – 2 Nos	Manufacturing / Procurement	Dimensional and termination details shall be finalized jointly during detailed design stage.	
04	60 KVA Transformers for Lighting – 2 Nos	Procurement	Dimensional and termination details shall be finalized jointly during detailed design stage.	
05	30 KVA Isolation Transformer for Rig Power supply – 1 No	Procurement	Dimensional and termination details shall be finalized jointly during detailed design stage.	
06	Lighting Fixtures and Lighting distribution boxes	Procurement	Design information of Lighting panels to be	



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	for PCR 1, 2 & 3		provided by bidder with dimensional Layout in the PCRs to enable BHEL to source panels locally in India.	
07	Internal power and control cable interconnections from panels to plug panels / socket boards (Except internal Fiber Optic Cables)	Procurement (except internal Fiber Optic Cables)	Detailed interconnection drawings for power and control connections to be provided by bidder to enable BHEL to do the internal cable interconnection work.	
08	415VAC MCC Motors & feeder 4/5 pin Plugs and Receptacles including 230VAC Lighting circuit 4/5 pin Plugs and receptacles for Plug panels of PCR 1, 2 & 3	Procurement	BHEL shall share the design and dimensional details of Plugs and receptacles to bidder during detailed design.	
09	Smoke detector and Fire Alarm system for PCR 1, 2 & 3	Procurement	BHEL shall share the design details with bidder during detailed design stage.	
10	Portable hand lamps for PCR 1, 2 & 3	Procurement	BHEL shall decide the details as per OIL tender requirement	
11	Earthing provision inside PCR 1, 2 & 3	Manufacturing / Procurement	Design information of earthing to be provided by bidder with dimensional Layout in the PCRs to enable BHEL to manufacture.	
12	Safety Rubber mats inside the PCR 1, 2 & 3	Procurement	BHEL shall decide the details as per OIL tender requirement	
13	Portable Dehumidifiers for PCR PCR 1, 2 & 3	Procurement	Bidder to provide details such as capacity of dehumidifiers to enable BHEL to procure the same locally in India.	
14	White Aviation Obstruction light with its control panel	Procurement	BHEL shall decide the details as per OIL tender requirement. BHEL shall share the details with bidder for space in the PCRs.	



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B Following items shall be in the scope of Bidder for supply to BHEL for manufacturing of PCR 1 & 2 by BHEL in India

SL.	Main equipment / items	BIDDER SCOPE	Remarks	Bidder's Response
01	Generator Control Panels, VFD Drive Panels for all AC drilling motors including Top drive, Power Rectifier panels, Brake Chopper panels, PLC / SBC / MTC Control panels including House HMI, UPS & Battery panels for PCR 1, 2 & 3 as a complete assembled lineup with interconnecting busbars and power & control connections between panels in a panel line-up.	Manufacturing, testing, Stage Inspection and supply to BHEL	Bidder to provide all assembly and electrical drawings to BHEL after detailed design.	
02	Brake Resistor Units 1&2	Manufacturing/Procurement, testing, Stage Inspection and supply to BHEL	Bidder to provide details to BHEL after detailed design.	
03	HVAC Units for PCR 1, 2 & 3	Manufacturing/Procurement, testing, Stage Inspection and supply to BHEL	Bidder to provide details to BHEL after detailed design. Roof Mounted HVAC units are preferable.	
04	Fiber Optic Cables with connectors for Internal interconnections inside the PCR 1, 2 & 3	Manufacturing/Procurement, testing, Stage Inspection and supply to BHEL	Bidder to provide details to BHEL after detailed design.	
05	Fiber Optic Cables with connectors for External interconnections from PCR 1, 2 & 3 to other external equipment / Remote IO Boxes. Each cable length to be 120 Mtrs	Manufacturing/Procurement, testing, Stage Inspection and supply to BHEL	Bidder to provide details to BHEL after detailed design. Each cable length of 120	



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			mtr shall be split in 2 parts to take care of intermittent socket board for extending cable lengths during cluster well drilling. All split section of cables shall have suitable FOC connectors at both ends.	
06	All Power and Control Plugs and receptacles including Generator Power and control, VFD Power & Control, MCC Transformer Power, Power and Control connections between PCR 1, 2 & 3 and any other power and control Plugs and receptacles for 3 rd Party equipment from PCR 1, 2 & 3	Manufacturing/Procurement, testing, Stage Inspection and supply to BHEL	Bidder to provide details to BHEL after detailed design. Plugs for the cable termination at remote equipment which are in bidder scope and are covered in this tender document to be in scope of bidder. 415VAC MCC Motor and Feeder and 230VAC Lighting circuit Plugs and Receptacles shall be in BHEL scope.	



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07	All Remote I/O Boxes required as per Bidder system design with suitable Plugs and receptacles	Manufacturing/Procurement, testing, Stage Inspection and supply to BHEL	Bidder to provide details to BHEL after detailed design. All remote boxes for the operation of 3rd party equipment not covered in this tender and for other equipment in bidder's scope covered in this tender to be supplied by Bidder.	
08	Complete set of documentation to enable BHEL to manufacture, testing & inspection of PCR 1, 2 & 3 at BHEL Bhopal India	Set of documentation	Bidder to provide details to BHEL after detailed design.	
09	Supervisory Assistance at BHEL Bhopal during manufacturing, testing & TPI inspection at BHEL Bhopal for 1 st set of PCR 1, 2 & 3	Supervisory assistance	Bidder to provide support	
10	All software as required for operation of system and supply to OIL as per tender conditions.	Copy of Software	Bidder to provide copy of software.	
11	All spares for main equipment of Bidder scope as covered in this tender document	Manufacturing/Procurement, testing, Stage Inspection and supply to BHEL	Bidder to provide details to BHEL after detailed design.	

Note : The above listed items are only the major requirements of the **PCR 1, 2 & 3** as per BHEL experience. Bidder to ensure that any other item, if required for **PCR 1, 2 & 3**, based on bidder's system requirement and is not covered in table A & B above has to be considered in Bidder's scope of supply. Bidder to list out such items during bid submission.



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1.0 THE PCR DESIGN STRATEGY SHALL BE AS FOLLOWING:

A. PCR-1 shall contain		Bidder's Offer	Deviation from BHEL Requirement
1	Generator control panels		
2	Diode Rectifier and VFD panels		
3	Auxiliary motor control panels (auxiliary motors required for the main drilling motors like blowers and lube oil motors)		
4	Auxiliary brake controller/ chopper shall be housed in the PCR-1; however, braking resistors if used, shall be outside the PCR enclosure, but on the same skid. The braking resistor shall be corrosion resisting, Stainless steel Punched grid type resistor (no wire wound type braking resistors shall be acceptable).		
5	Plug socket compartments for interconnection with various main and auxiliary loads		
6	Any other electrical system like air conditioners etc., necessary for operation of the rig electrical equipment		
B. PCR-2 shall house:			
1	Diode Rectifier and VFD panels		
2	MCC for all other auxiliary motor starters/ feeders		
3	Soft-starter panel for 75HP/100HP motors		
4	Main transformers, 2 nos. lighting transformers and 1 no. isolation transformer		
5	Aviation (white flasher) obstruction light control panel		
6	Plug socket compartments for interconnection with various main and auxiliary loads		
7	Any other electrical system necessary for operation of the rig electrical equipment		



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8	NGR panel		
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C. C.PCR-3 (optional) shall house (PCR3 to be offered only if TDS drives are not being accommodated in PCR 1 & 2) :		Bidder's Offer	Deviation from BHEL Requirement
1	Diode rectifier and VFD panels of Top drive system , Mud pump system & its auxiliaries		
2	Auxiliaries of Top drive system, Mud pump system		
3	Dynamic braking of Top drive		
D. Notes:		Bidder's Offer	Deviation from BHEL Requirement
1	Note-1: The VFD panels shall be strategically distributed among the PCRs for flexibility of operation.		
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.		
3	Note- 3: HMI panel of PLC/SBC/PAC shall be present in all the PCRs for monitoring.		

2.0 DIMENSIONAL DETAILS & CONSTRUCTIONAL FEATURES:

A. Dimensional Details & Operating Environment		Bidder's Offer	Deviation from BHEL Requirement
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 : Ref Section 3.5 weight- refer section 3.5		
2	The PCR (s) shall be capable of delivering rated output continuously in		



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	the following environmental conditions: i) Max. ambient temperature :45 degree centigrade ii) in. ambient temperature: 04 degree centigrade iii)Altitude: 1000 m above sea level. iv) Relative humidity: 98% v) Atmosphere : Dusty		
B. General construction features of PCRs			
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.		
2	Skid: The Skid design shall incorporate at least 4(four) longitudinal channels with two mid channels kept sufficiently apart so that the unit can be placed evenly on narrow trailers (general width of trailers 2.4 to 2.6 meters only) with proper load distribution & balancing. Each longitudinal channel of a skid shall be of single length and shall have smooth finish underneath and curve finish at both the end, so that the skid can roll over smoothly on surfaces/truck body without any obstruction. The skid so designed should be sufficiently strong and properly welded at joints and should be able to withstand shocks while being handled and transported over rough and slushy roads/locations. Height		



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	of the joint used for the longitudinal members should be minimum 20 cm. Sufficient provision should be available at both ends for lifting the entire PCR (bottom lift arrangement). The skid shall be properly prepared, and painted with black coal tar epoxy paint with a final thickness of about 200 microns.		
3	Thermal Insulation: Walls to be insulated with three-inch thick polystyrene block insulation/ Glasswool/rock wool or any other suitable insulation. The floor and the wall with the receptacles and plugs will not be insulated. The inside surface of the walls shall be finished with a sandwich style insulating board three eighths of an inch thick with white pebble coating on the interior side and aluminium foil on the exterior side.		
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.		
5	Plug Panel: Plug panel for the Generator and Drilling motor cables to be provided on the front end plug panel (facing the DWS). In case it is difficult to provide generator plug panel on front end then standard arrangement of supplier i.e. generator plug panel recessed type on the side facing power packs can be provided but height of such plug panel should be around 1.5 mtrs from bottom of the PCR. The Plug Panel(s) should feature shutter or doors which can be closed/ opened smoothly with all the cables plugged in, during normal running condition to avoid ingress of water inside the plug panels due to rain. Interior & exterior sides of plug socket compartment on the PCRs shall be adequately illuminated using 10 W LED light fixtures.		



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6	Indoor Lighting: Three numbers of 2X24 W LED lamps shall be used for aisle lighting of each PCR. Four- 230 volt Phase – Phase duplex receptacles (suitable for Indian style plug pins) to be included, two at each end of the house. The PCR shall be equipped with portable type emergency lamps which shall adequately light up the PCR in the event of a blackout. Additionally, two emergency lighting fixtures with EXIT sign to be also included at each end of the House. There shall be emergency floor-path illuminations (fluorescents strips) guiding towards exit doors of PCRs for emergency evacuation.		
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.		
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	Markings on the Body of PCRs: The Two ends of the PCR shall be labelled "Draw works End" and "Compressor End", as appropriate. The sides will be painted with Oil India's logo (to be provided), and the Words "Oil India Limited", "A Government of India Enterprise", "VFD PCR- 1/2/3", "Rig #NAME ", the Purchase Order Number, Dimensions and weight of the PCRs, Manufacturer's Name and any Lifting Instructions.		
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		



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	shall be installed inside the PCR.		
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.		
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.		

3.0 MAIN COMPONENTS OF POWER CONTROL ROOMS:

A. RIG CONTROL SYSTEM:

The integrated drilling control system for managing, controlling, and monitoring rig floor equipment in independent and activity-based operations shall be provided. The system shall be designed to allow operators to focus on Drilling, Tripping, and Stand-Building and ant other processes by providing an efficient and intuitive rig floor command centre.

The rig control system shall have the following features for overall VFD drives control, interlock with auxiliaries and monitoring.

Rig Control System:		Bidder's Offer	Deviation from BHEL Requirement
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.		
2	The main elements of the Integrated System are the i) Multi-Tool Control Cabinet, which houses PLC/SBC/PAC modules and network devices, Gateway interface with third party equipment, communication hardware etc. ii) operator workstations to drive the rig equipment		
3	The Rig control system shall connect		



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	via the network to touch screens and/or to workstation hardware (such as joysticks, brakes, control switches, speed pots etc.) to provide control and monitoring of rig floor equipment.		
4	The Rig control system design shall avoid single point failures through a robust network with redundant touch screen HMIs running in parallel.		
5	In case of failure of rig control system, the system will be provided with a 100% redundant/standby control system for uninterrupted drilling operation. Both the control systems shall have exact identical configuration in all aspects. Redundant/Standby control system shall have each of following components (e.g. CPU/Power supplies/IO modules/Interface modules/Profibus or FO cable etc.) as that of the main Control system. The standby control system shall not be a part of the main control system. There shall be provision to bring the standby control system online immediately if the running control system is having any issues (with manual/hot standby type changeover).The bidder may submit their strategy to design such a standby control system.		
6	The control system should be complete with all necessary software, hardware and remote communication capability. Control system software shall be licensed to Oil India Limited (OIL). Such Licenses should not have expiration dates. If any of the software is modified or altered for use in OIL's drilling rig, same shall be informed and shall be supplied to OIL. The software and hardware used in the control system shall be the latest available in the market with the provision to upgrade in future.		
7	There shall be provision to log historic data of the inputs by the driller, readings of Draw works, Mud pumps, IRD, Top Drive, power packs etc. In addition, fault storage facility and history/ trend data should be available in the system for at least 48 hours with built-in self-diagnostic features.		



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8	Each PCR shall be equipped with touch screen HMIs for monitoring purpose. Both main HMI & extended HMI in PCRs shall be same as the one in the driller's workstation with only read mode (One should not be able to operate the drives from the HMIs in the PCR).		
9	Control system for Top drive shall be same as that of Draw-works/mud-pump /IRD control system. Controls for all drilling equipment shall be integrated in same HMI/operator screen of Driller's workstation as well as the HMIs in the PCRs.		
10	On-line UPS of suitable capacity for emergency backup of the Control System for a period of 30 minutes shall be provided. Two UPS's shall provide backup for the control system. The UPS's shall include bypass switches which will allow line power to be fed directly to the load in case of UPS failure.		

B. 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):		Bidder's Offer	Deviation from BHEL Requirement
1	Miscellaneous indicators		
	System Communication OK		
	Generator ON (For each Generator & and loading percentage)		
	Ground Fault (600 VACS / 415 VACS/ DC BUS/ VFD)		
	Power Limit status		
	Running drives		
	Rectifier/ converter panel indications		
	Brake status		



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	Any Fault/ alarm		
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		
3	Mud Pump Indicators (To be repeated for each Pump)		
	MP Chain Oilers ON (if provided)		
	MP Main Lubes ON (if provided)		
	MP Blowers ON		
	MP Liner Washers ON		
	Charging Pump 1 ON		
	Charging Pump 2 ON		
	MP motors current (Amps), Voltage, speed, Torque etc.		
	Fault/ alarm		
	Mud pumps parameters (SPM, Total strokes, running hours, PSI etc.)		
4	Draw Works/ Rotary Indicators (Repeated for Each Motor)		
	DWA/DWB/ Rotary ON		
	DWA/DWB/Rotary-		
	Forward/Reverse		
	DWA/DWB/ Rotary Blower ON		



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	DW/ Rotary Lube pump (s) ON		
	Fault/ alarm		
	Draw works Parameters (Current, Torque, speed, KW, voltage etc.)		
5	Top drive Indicators		
	Blowers ON		
	Lube pump ON		
	Fault/ alarm		
	Top drive parameters (KW, Amps, Torque, rpm, throttle signal etc.)		
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		

C. GENERATOR CONTROL PANEL (Quantity: 05 nos.):

Generator control panels (5 Nos) shall be suitable for operating, controlling & protecting the Engine-alternator sets. The generator control system shall be suitable for individual running or paralleling & load sharing with other power packs. There shall be one alternator control panel per alternator.

a. SALIENT FEATURES OF GENERATOR CONTROL PANELS:

The Generator control system shall be suitable driving 1430KVA, 600VAC, 50 Hz 0.7 PF lagging Alternators driven by CAT 3512B Engines.

GENERATOR CONTROL PANELS ARE TO BE FITTED WITH :			
1	Generator control unit (package) for operation, control, metering and protection of Alternator/Engine		
2	Withdrawable type incomer air circuit breaker (make: Siemens/ ABB/ Schneider/ Merlin Gerin/ Allen-Bradley) of sufficient nominal rating, breaking/ withstand and making		



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	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.		
3	Breaker ON/OFF ON/OFF (Close/ Open) pushbuttons		
4	Engine control switch OFF-IDLE-RUN (this switch shall duplicate with the OFF-IDLE-RUN switch in Engine control panel).		
5	Engine speed & alternator voltage adjust potentiometers		
6	Real power sharing scheme		
7	Reactive power sharing scheme		
8	LED Indication lamps (with Low Voltage Glow Protection) -Gen. RUN, Gen. ON-LINE, Gen. SYNCH, Gen. FAULT, Engine FAULT etc.		
9	Control Transformers, fuses, links, terminal blocks etc. (if any)		
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.		
11	Any other Electronic control system for remote communication with other devices/ equipment		
12	Synchronizing controls consisting of reverse power relay, Phase rotation relay for phase sequence check on the generators with interlocking for synchronization, synchronizing lights and switch		
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).		

b. EACH PANEL SHOULD BE FITTED WITH THE FOLLOWING METERS:

Generator control panels meters		Bidder's Offer	Deviation from BHEL Requirement
1	Alternator Ammeter 0-2000 A (selectable for R,Y,B phases)-Analog type		



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2	Alternator Voltmeter 0-1000VAC-Analogue type		
3	Alternator Kilo-watt meter , (-)150-0-1500 kW- Analogue type		
4	Alternator Kilo-var meter, (-)150-0-1500 kVAR- Analogue type		
5	Alternator power factor meter (-)1.0 – 0 – (+)1.0- Analogue type		
6	Alternator Kilowatt-hour meter -Digital type		
7	Generator cumulative running Hours meter - Analog type		
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		

c. ENGINE GOVERNOR CONTROL:

Engine governor system shall be as specified below:

Engine governor control		Bidder's Offer	Deviation from BHEL Requirement
1	Solid State Control Module / Fully Electronic Engine Controller (Governor) with Response time of 0.8 second typical Maximum load unbalance between engines (one hot, one cold) at all points, no load to full load, $\pm 5\%$ of its rated load Working temperature range of -30°C to $+55^{\circ}\text{C}$ No load to full load regulation of $\pm 1\%$		
2	Speed feedback/MPU Signal Range: Bidder to specify (1000RPM engine & 183 flywheel teeth)		
3	Engine throttle/actuator signal range: Bidder to specify (0-200mA)		
4	Suitable kW load sharing scheme should be implemented. Bidder to indicate scheme / type of load sharing employed.		

d. ALTERNATOR VOLTAGE REGULATOR:

Alternator Voltage regulation system shall be as specified below:



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Alternator voltage regulator		Bidder's Offer	Deviation from BHEL Requirement
1	Voltage Regulator for brushless excitation system (the latest technology available)		
2	The voltage regulation is to be limited to 3% droop (Max.)		
3	Suitable KVAR load sharing scheme should implemented. Bidder to indicate scheme / type of load sharing employed.		

e. ENGINE/GENERATOR PROTECTION FEATURES:

Various Protection functions shall be built into the control module as specified below:

Engine/generator protections		Bidder's Offer	Deviation from BHEL Requirement
1	The alternator protection features shall include: a) Over current b) Overvoltage c) Over frequency d) Under frequency e) Reverse Power		

D. CONVERTER/ RECTIFIER PANELS:

Suitably rated Two (02) or more incomer /rectifier sections shall be provided in each PCR (strategically distributed) for supplying the VFD line-up, each of which shall include the following:

Components of converter/ rectifier panels		Bidder's Offer	Deviation from BHEL Requirement
1	Suitably rated withdraw able type ACB with shunt trip, necessary auxiliary contacts.		
2	06-pulse air-cooled diode bridge rectifier with insulated transparent sheet for safety purpose		
3	Input Line Reactors of sufficient rating with insulated transparent sheet for safety purpose		
4	High Speed semiconductor fuses with indicator switches		
5	Heat sink-mounted temperature RTDs/temperature switches		
6	AC & DC voltmeters/ multifunction meter		



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7	Surge suppressor system		
8	Panel heater with thermostat		
9	DC Ammeter		
10	LED indication lamp indicating: System charged; fault etc.		
11	Suitably rated panel fan shall be used to provide sufficient cooling		

E. VFD/ INVERTER PANELS:

a. PCR's shall house air cooled VFD inverter panels of sufficient capacity, suitable for driving the following:

Details of VFD inverter panels		Bidder's Offer	Deviation from BHEL Requirement
1	One 2000 HP Draw Works (driven by two min. 1100 HP AC VFD motors)		
2	Three 1600 HP mud pumps (each mud pump driven by two min. 1100 HP AC VFD motors)		
3	One Independent rotary drive (driven by one min. 1100HP AC VFD motor)		
4	One Top Drive (driven by AC VFD motors)		
5	One spare panel (fully functional, rated for the highest powered drive)		

b. Each VFD inverter panel shall consist of the following main equipments:

1	Suitably rated DC MCCB/ ACB with adjustable trip, manual Charging, auxiliary contacts		
2	DC Pre-charge Circuit (Manual pre-charging)		
3	Voltmeter /Ammeter		
4	LED indication lamp indicating: System charged; fault etc.		
5	Inverter (s) modules, suitably rated		
6	Semiconductor fuses with indicator switches		
7	DC link filters		
8	Control module (s), card (s), cables etc.		



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9	Communication modules		
10	Operator panel/HMI in front fascia of panel		
11	Emergency Stop Safety Relay		
12	Cubicle Space Heater		
13	Blower unit for cooling of the VFD panel		
14	Fault alarm (on HMI /touch screen display of Driller's cabin & PCRs) with external electrical hooter and indication red lamp.		

c. Notes:

1	The inverter panels shall be strategically distributed among the PCRs for flexibility of operation.	Bidder's Offer	Deviation from BHEL Requirement
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.		
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 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 Drillers Cabin. Additionally, alarm shall be raised at PCRs with loud sound hooter & lamp.		
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.		
5	The inverter modules shall be interchangeable among different VFD		



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	inverter panels.		
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F. BRAKE CHOPPER PANEL:

Brake chopper panels shall consist of the following:

Brake chopper specification		Bidder's Offer	Deviation from BHEL Requirement
1	DC Brake Chopper with suitably rated continuous current output to match the full dynamic braking of the draw-works with sufficient overload capacity		
2	Over current Alarm		
3	LED indication lamp: DC bus charged; fault etc.		
4	Semiconductor fuses with indicator switches		
5	Resistor bank Temperature monitoring circuit		
6	Resistor bank cooling fan pressure monitoring circuit		

G. BRAKING RESISTOR BANKS:

Suitably rated resistor banks shall be provided for dynamic braking. The banks shall be on the same skid as PCR, but outside the enclosure. The resistor banks shall consist of:

Brake resistor specification		Bidder's Offer	Deviation from BHEL Requirement
1	Stainless steel air cooled resistors, suitably rated for the system		
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)		
3	Thermal limit switch		
4	Pressure sensing switch		
5	IP 23 MS steel resistor bank enclosure		
6	IP 56 MS steel cable termination box		
7	The resistor bank shall use Stainless steel Punched grid type resistors.		



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H. FEEDER PANEL - Number ONE (01)

A feeder panel shall be provided to house following items:

a. TRANSFORMER FEEDER BREAKERS:

Transformer feeder ACB/MCCB		Bidder's Offer	Deviation from BHEL Requirement
1	1000 - 1200 Amps, 600 Volts, 3-Pole, manually operated of make mentioned in Section 3.6, Air Circuit Breakers/MCCBs having breaking capacity of 65 KA each for 2 X 750 KVA 600/415V 50 Hz, Delta/Star Dry Type Power Transformer for powering auxiliary AC loads and rig lighting system.		
2	ACB/MCCBs should be settable from 0.4 x 1 of rated current with electronic release. The interrupting rating of the breakers will minimally be 65 Kilo Amperes		

b. SYNCHRONIZING SYSTEM:

Alternator synchronizing system		Bidder's Offer	Deviation from BHEL Requirement
1	The synchronizing system shall feature the following minimum instruments: a) Synch. switch b) Synchroscope c) Synchronising 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. Synchronising 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).		
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.		
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.		



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c. GROUND FAULT DETECTION CIRCUIT (in the 600 VAC Circuit):

Ground fault detector		Bidder's Offer	Deviation from BHEL Requirement
1	Ground Fault detector circuit shall mainly consist of the following: a) 600 VAC ground fault detection: Ground fault detection circuit, 3 nos. ground fault lights (for each phase), percentage AC ground fault meter b) DC ground fault detection: DC ground fault detection system (for rectifier+ DC bus/ link system) with percentage DC ground fault meter (+/-), test pushbutton c) 415 VAC (AC auxiliary bus)- with NGR system		
2	Audio Alarm in PCR in addition to indication at Driller's Console shall be provided for ground fault system. Ground fault circuit should be of standard design of OEM connected to each phase and to the ground through individual phase lamp (filament type). In case of AC ground fault the phase which is grounded will have lower illumination in the lamp connected to that phase and in DC ground fault all the 3 lamps will glow brighter.		

d. POWER LIMIT CONTROL FEATRE:

Power limit controller		Bidder's Offer	Deviation from BHEL Requirement
1	The Power Limit Control shall be incorporated to monitor the KW (i.e. actual loading of engines) & 'I'-Total (i.e. KVA loading of alternators) of each of the Engine-Generator sets. If the load on the system tries to exceed the rating of the engines or generators, then the power limit circuit will clamp or reduce the power drawn by the Variable frequency drives until load demand is reduced to a level below the set power limit.		
2	The range of adjustment will allow the Power Limit to be lowered to 80% or raised to 100%.		
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		



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	limit situation. b) A warning lamp shall be illuminated on the Driller's Console when power limit is being approached.		
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e. HANDS-OFF CIRCUIT (HOC):

Hands-off circuit (HOC)		Bidder's Offer	Deviation from BHEL Requirement
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.		
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		

I. FEEDER BREAKER – Number Two (02):

Two nos. of 600 VAC Feeder breaker for supplying power to external drives from main bus shall be provided at a convenient location in the PCR for Top drive house(if TDS Power control room is designed as separate house) & future provision e.g. Power Factor improvement device etc. The feeder breaker shall be as per following details.

Air circuit breakers 600VAC		Bidder's Offer	Deviation from BHEL Requirement
1	Feeder Breaker for Top Drive House: ACB rated 1200 Amps/Suitably rated 600V AC, 3-pole, 50 Hz, 65 kA of make mentioned in Section 3.6, with adjustable trip, Draw-out type. Breaker shall be manually chargeable/ motorized, electrically closed and electrically tripped and with auxiliary contacts. The Feeder breaker to be furnished to be directly interchangeable with the Generator panel incomer circuit breakers. UV coil shall not be required for the Feeder breaker.		
2	Feeder Breaker (Spare): ACB rated 2000Amps 600V AC, 3-pole, 50 Hz, 65 kA of make mentioned in Section 3.6, with adjustable trip, Draw-out type. Breaker shall be manually chargeable, electrically closed and electrically tripped and with auxiliary contacts. The Feeder		



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	breaker to be furnished to be directly interchangeable with the Generator panel incomer circuit breakers.		
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J. NGR SYSTEM:

Restricted earth leakage protection shall be provided at 2x750 kVA transformer star connected secondary. The NGR system shall have the following features:

NGR System		Bidder's Offer	Deviation from BHEL Requirement
1	Earth fault current shall be restricted at 750 mA		
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.		

K. AC CONTROL PANELS/MOTOR CONTROL CENTRE:

Motor control centre or MCC shall be fed from the auxiliary 415 AC bus in PCRs fed from the secondary of the main transformers (600 V/ 415 V, 3 phases, 50 Hz). Various auxiliary motor drives, PCR lighting and air-conditioning system shall be supplied from the MCC panel through switchgear. The list of starters/feeders as given in this documents is to be incorporated. Actual load list shall be decided after detailed engineering of the complete rig package.

a. MCC FEATURES:

Motor control centre features		Bidder's Offer	Deviation from BHEL Requirement
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.		
2	Bus shall be accessible for maintenance. AC bus bars shall be insulated properly. A voltmeter and 'bus bar live' indicator lamp shall be provided indicating bus status.		
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		



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	these starters.		
4	All other starters shall be operated from push button stations (PBS) mounted near the respective drive motors.		
5	Motors of 75HP & above shall be started using a soft-starter. Each soft starter shall be provided with one spare socket.		
6	Starter panel for motors below 75HP shall be DOL Starter type		
7	Superchargers shall have on/off control at D'CON (both manual & auto)		
8	Each motor panel should have the following minimum components located on the front fascia A) One overload reset button B) MCCB operating handle / lever with TRIP, ON, OFF positions marked c) LED Indication lamps (with Low Voltage Glow Protection feature) for motor ON/OFF, RUN, OVERLOAD TRIP, EARTH LEAKAGE TRIP d) Selector switch for HAND / OFF / AUTO for required starters e) One ammeter to indicate load current		
9	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.		
10	All the starters for AC motors (except Shale Shaker, Mud Cleaner, BOP, Bug blower, Degasser, Centrifuge, Air Compressor) irrespective of rating are to be housed in the MCC panel of power control room and only push button stations with On/Off controls are to be located near respective equipment. All motors and push button stations will be directly		



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	connected to the power control room through individual cables and plug sockets.		
11	<u>415V Emergency Bus:</u> The power from the 250 KVA Genset shall be fed into an emergency 415V bus bar inside the PCR. To limit the load on 250 KVA Gen set, only following outgoing feeder / Motor Starter panel shall be from the 415V Emergency Bus: A) One feeder for Isolation transformer hut, B) one feeder for Air compressor, C) one number water booster Motor D) Hydraulic motor (for rig up / down), E) Hazardous area lighting (i.e incomer of 60 KVA lighting transformer		
	There shall be provision for electrical isolation of the emergency bus bar from the main 415V bus bar using a withdrawable type aircircuit breaker (ACB) (of make mentioned in Section 3.6) of sufficient nominal rating, breaking/ withstand and making capacity, manually chargeable, electric closing, with solid state trip unit. There shall be an interlocking of the 250 KVA generator output ACB and the emergency busbar isolation ACB such that only one of the two operates at a time		
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 (the emergency bus shall be fed from rig alternators), 250 KVA generator output ACB must open automatically. However, when Rig Alternators are not in operation, the emergency bus bar shall be fed from the 250 KVA generator set with the 250 KVA generator outgoing ACB closed and emergency bus isolation ACB must open automatically).		



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b. PROTECTION:

All starters and feeders shall have individual MCCBs as incomers, except those started with the soft starters. However, for the soft starter started motor groups, there will be a single incomer MCCB per group, with sufficient current carrying capacity for simultaneous running of all motors in the group at full load.

Protection in Starter/Feeder panels		Bidder's Offer	Deviation from BHEL Requirement
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 e) an earth fault in that particular circuit (30 mA & 300 mA selectable		
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. The MCCB shall have clear ON/OFF/TRIP positions. d) The MCCB should have facility for time Delayed-Overload protection (adjustable 0~10 sec, 0.7~1.2 In), Short circuit protection (10 x In), and separate (add-on) RCD with trip setting of both 30mA and 300mA. e) Operating handle should be accessible from the exterior of the MCC cubicle, with the door shut. f) All the power cable terminations are to be done with proper colour coded terminal blocks i.e. red, yellow, blue etc.		
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		



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	the starter panels should be of a single make.		
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c. PUSH BUTTON STATION (PBS not in scope of Bidder) :

Starter panels shall be operated from push button stations (PBS) mounted near the respective drive motors. Push button stations shall be in scope of BHEL, however the required features which needs to be incorporated in starters are as under :

PBS specifications:		Bidder's Offer	Deviation from BHEL Requirement
1	Remote PBS (Push Button Station) / Hand-Off-Auto feature as required		
2	Control Circuit voltage shall not exceed 30 V (As per OMR-2017, 125(4(b)))		
3	Control Circuit including Remote PBS shall have earth leakage protection		
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 should satisfy requirements for installation in Zone 1/Zone 2 Hazardous area, Gas groups IIA & IIB.		

L. PCR AIR CONDITIONING:

The PCR (s) will be air conditioned and humidity controlled. The ambient air is expected to vary from 4 Deg C to 45 Deg C.

The air conditioning for the PCR (s) shall be properly sized and air conditioning units located to take into account the heat generated by internal equipment in full load conditions in locations with high ambient

Air Conditioner requirements		Bidder's Offer	Deviation from BHEL Requirement
1	Air conditioning system components shall preferably be located on the same skid as the PCR.		
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.		



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3	The temperature inside the PCR (s) should not exceed the recommended level for the rectifier, inverters & other semi-converter devices under any circumstances.		
4	Additionally, the air conditioners shall be able to reduce the relative humidity level to recommended levels from 98% by itself.		
5	The AC system should have 100% redundancy, i.e., half the capacity should be standby at all time.		

M. PCR INTERNAL LIGHTING:

PCRS INTERNAL LIGHTING:		Bidder's Offer	Deviation from BHEL Requirement
1	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.		

N. INTERNAL CABLING:

INTERNAL CABLING		Bidder's Offer	Deviation from BHEL Requirement
1	All internal wiring of the MCC/starter panels, control wiring etc. shall be done with 1.1 KV grade fire retardant PVC insulated tinned copper multi- stranded flexible cables with proper lugs.		

O. TYPE OF EARTHING:

TYPE OF EARTHING:		Bidder's Offer	Deviation from BHEL Requirement
1	IT system of neutral grounding with maximum ground fault current limited to 750 mA using suitable NGR as per CEA Regulations is to be used. All breakers, MCCB, MPCB shall be suitable for IT system as per IEC 947-2. The neutral shall not be served and supply from the main MCC bus shall be 3 Phase & 3 Wire. Main Transformers' output shall be provided with a Residual Current Monitor (RCM) for indication/ alarm. Scheme, Type, Make and Model of RCM shall be submitted for approval of OIL.		

P. PLUG AND SOCKET PANELS:



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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.

Plug socket compartment:		Bidder's Offer	Deviation from BHEL Requirement
1	Two (2) / Three (3) nos. plug socket compartments shall be provided for the ease of quick rig-up and rig-down operations.		
2	Plugs/sockets of same make (preferably) shall be fitted in the all cables. The plug and receptacles of PCR socket board shall be of make specified in Section 3.6.		
3	Plugs & sockets (crimped type) should be suitable to accommodate up to 300 sq mm flexible copper cable with built-up conductor diameter of 26 mm & OD of 35 mm (+/-1 mm).		
4	The alternator socket board should be provided with adequate nos. of sockets/cables per phase to carry rated current of alternator continuously.		
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 .		
6	The plug sockets cable termination shall be crimped type. Horizontal steel bars shall be provided in the compartments for supporting the layers of cables.		
7	The plug / socket compartments shall be well illuminated and each plug/socket shall be suitably marked for ease of identification of circuits/ loads.		
8	There should be adequate number of spare sockets of each type available in the socket board.		
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)		



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Q. TRANSFORMERS:

TRANSFORMERS:		Bidder's Offer	Deviation from BHEL Requirement
1	There shall be five power transformers in all: a. Two Main Transformer (750 kVA) for MCC supply b. Two Lighting transformers (60 kVA each) for lights in hazardous areas c. One isolation transformer (30 kVA) for camp-site power & general lighting		
2	All the transformers shall be protected through suitably rated MCCBs in the primary and secondary sides. All live parts of the transformers not insulated shall be protected adequately. Transformers shall be placed at suitable positions, taking into consideration working space, socket board positions, equal distribution of weight of the PCR etc		

a. 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 PCR Starters/Feeders" as per following broad specification:

Main Transformer Specification:		Bidder's Offer	Deviation from BHEL Requirement
1	Capacity – 2 x 750 KVA minimum, continuous rating		
2	Voltage – 600/415 volts		
3	Vector Group – Dyn11, star connected secondary with neutral terminal available in terminal box		
4	Frequency – 50 Hz		
5	Phases – 3 phase		
6	Impedance – 5% for connection		
7	Ambient temperature 4-47 Deg C		
8	Insulation – Class H (or 220 Deg C)		
9	Cooling- Air Natural cooled		



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10	Rated power freq. withstand – 3 kV (RMS) or better		
11	Standards – Indian Standard IS: 11171 or equivalent international standard		
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.		

b. LIGHTING SUPPLY TRANSFORMERS FOR HAZARDOUS AREA LIGHTING:

Two (02) nos. lighting supply transformer (240 VAC Phase- Phase) as per the following broad specifications:

Lighting supply transformers Specification:		Bidder's Offer	Deviation from BHEL Requirement
1	Capacity – 2x 60 KVA, continuous rating		
2	Voltage – 415/240 volts (Phase-to-Phase)		
3	Frequency – 50 Hz		
4	Phases – 3 phase		
5	Impedance – 5%		
6	Vector Group – Dyn11, Star connected secondary, neutral available for connection		
7	Enclosure – IP23 type, with provision for natural circulation of cooling air.		
8	Ambient temperature 4-47 Deg C		
9	Temperature rise above ambient – 80 Deg C		
10	Insulation – Class F		
11	Rated power freq. withstand – 3 kV (rms) or better		
12	Standards – Indian Standard IS: 11171 or equivalent international standard		
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		



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	nut and bolts		
14	Secondary side of the lighting transformers (415/240 VAC, phase-to-phase, supplied from the AC main 415 bus) shall be connected to the 3- phase rig lighting DB. The lighting DB rating shall be sufficient for supplying the hazardous area of rig and mast lighting		
15	Special requirement: Provision shall be given for supplying the lighting DB from external supply, in case of failure of the lighting transformers. Accordingly, a suitably rated change over switch shall be provided in the MCC panel, in conjunction with the feeder supplying the lighting transformers.		

c. ISOLATION TRANSFORMER:

One (01) no. 30 KVA dry type isolation transformer with the same specification as the lighting transformers, except the following:

Isolation Transformer Specification:		Bidder's Offer	Deviation from BHEL Requirement
1	Capacity– 1x 30 KVA, continuous rating		
2	Voltage – 415/415 volts, Dyn11, neutral available for connection.		
3	The isolation transformer shall be used to supply the general rig area lighting (230V L-N for PCR internal lighting/Engine house/compressor house lighting etc.), crew camp power supply and auxiliary loads which need a 240 V phase-to-neutral connection. Neutral of the isolation transformer shall be grounded solidly.		
4	Primary and secondary side terminations: 1.Two nos. 3 core, 35 mm ² cable for both primary and secondary sides. 2.Stand-off copper termination (termination using copper flats) shall be provided. All cable lugs shall be terminated using removable nut and bolts.		

S. POWER FEEDERS:

Apart from motor starter panels, certain other loads are also required, e.g. Welding sets, Hand tools, Effluent treatment plant, Logger house, Deviation bunk house, power tong etc. There should be individual 3 Phase feeders for such loads.



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T. SMOKE DETECTION AND FIRE ALARM SYSTEM:

Following shall be the scope of supply for the Smoke detection and fire Alarm System:

Smoke Detection And Fire Alarm System		Bidder's Offer	Deviation from BHEL Requirement
1	Smoke detector: Photoelectric or Ionized type.		
2	Control Panel with Manual call Point (MCP)		
3	Internal house buzzer, 80 dB at 1 m		
4	External house hooter, Min 100 dB at 1 m		
5	Wiring and installation accessories kit		
6	Any other material required for the installation and satisfactory operation of the system.		
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.		
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	The PCRs shall have smoke detection and fire Alarm System as per requirement of OISD Std. No: 216 for Electrical Safety.		

U. ANNEXURE - PCR STARTERS/FEEDERS:

a. The starter/ feeders shall be inclusive but not limited to the following list:

Sl.No	Motor Load	Application	Remarks
1	100 HP	Desander (ULMMC)	Cable size shall match motor HP
2	100 HP	Desilter (ULMMC)	
3	100 HP	Mud Mix-1	Cable size shall match motor HP
4	100 HP	Mud Mix-2	
5	100 HP	Super Charger-1	
6	100 HP	Super Charger-2	



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7	100 HP	Super Charger-3	
8	75/100 HP	Hydraulic Unit -1	
9	75/100 HP	Hydraulic Unit -2	
10	100 HP	Spare - 1	
11	100 HP	Spare - 2	
12	60/75 HP	Centrifuge	
13	30/40 HP	Water Pump-1	
14	30/40 HP	Water Pump-2	
15	10/15/20 HP	Trip Tank-1	
16	10/15/20 HP	Trip Tank-2	
17	10/15/20 HP	Mud Agitator -1	
18	10/15/20 HP	Mud Agitator -2	
19	10/15/20 HP	Mud Agitator -3	
20	10/15/20 HP	Mud Agitator -4	
21	10/15/20 HP	Mud Agitator -5	
22	10/15/20 HP	Mud Agitator -6	
23	10/15/20 HP	Mud Agitator -7	
24	10/15/20 HP	Mud Agitator -8	
25	10/15/20 HP	Mud Agitator -9	
26	10/15/20 HP	Mud Agitator -10	
27	10/15/20 HP	Mud Agitator -11	
28	10/15/20 HP	Mud Agitator -12	
29	10HP	Ground Water Pump-1	
30	10HP	Ground Water Pump-2	
31	30/40 HP	Disc brake cooling Motor	
32	30/40 HP	Disc brake cooling Motor	Cable size shall match motor HP
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	Cable size shall match motor HP
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	Cable size shall match motor HP
43	3/5 HP	MP1-Liner Flushing	
44	3/5 HP	MP2-Liner Flushing	
45	3/5 HP	MP3-Liner Flushing	
46	3/5 HP	MP1-Chain Oiler-1	
47	3/5 HP	MP1-Chain Oiler-2	
48	3/5 HP	MP2-Chain Oiler-1	
49	3/5 HP	MP2-Chain Oiler-2	
50	3/5 HP	MP3-Chain Oiler-1	
51	3/5 HP	MP3-Chain Oiler-2	
52	3/5HP	MP1-Mud Pump Lube	
53	3/5HP	MP2-Mud Pump Lube	
54	3/5HP	MP3-Mud Pump Lube	
55		Top drive blower Motor -1	
56		Top drive blower Motor -2	
57		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	5/3 HP	DW Lube-1	
62	5/3 HP	DW Lube-2	



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63	5/3 HP	Degasser	Cable size shall match motor
64	5/3 HP	Bug Blower	
65		Shale Shaker-1A	
66		Shale Shaker-1B	
67		Shale Shaker-2A	
68		Shale Shaker-2B	
69		Shale Shaker-3A	
70		Shale Shaker-3B	
71	5/7.5 HP	Liquid Dispensing Pump-1	
72	5/7.5 HP	Liquid Dispensing Pump-2	
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	Cable size shall match motor HP
79	10 HP	Cellar pit motor	
80	30/40 HP	Spare – 3	
81	30/40 HP	Spare – 4	
81	10/15/20HP	Spare – 5	
83	10/15/20HP	Spare – 6	
84	10/15/20HP	Spare – 7	
85	10/15/20HP	Spare – 8	
86	10/15/20HP	Spare – 9	
86	10/15/20HP	Spare – 10	
87	15 HP	Spare – 11	
88	10 HP	Spare – 12	
89	5/7.5 HP	Spare – 13	
90	3/5 HP	Spare – 14	
91	3/5 HP	Spare – 15	
92	3/5 HP	Spare – 16	
93	3/5 HP	Spare – 17	
94	3/5 HP	Spare – 18	
95	3/5 HP	Spare – 19	



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b. TENTATIVE MCC- Feeder Circuit Breakers Data

Sl.No.	Rating	Application	Remarks
1	125 A	Compressor-1	Cable size shall match motor HP
2	125 A	Clear fluid system	
3	425 A	(250) KVA DG Incomer	
4	63A	Welding set	
5	125A	VFD House AC-1	
6	125A	VFD House AC-2	
7	63A	DRILLER CABIN HVAC	
8	63A	DRILLER CABIN PURGE	
9	125 A	Area light DB 1	
10	125 A	Area light DB 2	
11	125 A	Lighting Transformer -1	
12	125 A	Lighting Transformer -2	
13	125 A	Spare	
14	125 A	Spare	
15	100A	BOP Feeder	
16	250 A	Isolation transformer hut	
17	250 A	Spare	
18	63A	Mud logging Unit	
19	63A	Spare	
20	63 A	Spare	
21	425 A	CEMENTING UNIT VFD	
22	425 A	Spare	

4.0 GENERAL POINTS:

BROAD OUTLINE :

Broad Outlines		Bidder's Offer	Deviation from BHEL Requirement
1	Though a broad outline on the requirement has been made, yet the scope should include anything not mentioned but required for completeness of the system to meet the requirement of oil well deep drilling rig (rig capacity being 2000 HP) and make the same suitable for dismantling, transportation and installation very often in rough and tough conditions		



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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. CEA Regulations, 2010 with amendments & Oil Mines Regulations, 2017 with latest amendments		
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.		
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. The supplier and the manufacturer in turn shall guarantee that spare parts shall be available for at least next fifteen years.		
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		



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6	The system including all sub-assemblies, panels and components should be designed to facilitate backward integration of future modules, cards etc.		
7	Provide all manufacturer test reports related to all meters to be installed in both PCR		
8	All levels in the rig, drawing, service manual or any other document shall be in English (USA or UK) language only.		

5.0 SPECIAL REQUIREMENTS:

Special Requirements		Bidder's Offer	Deviation from BHEL Requirement
1	The use of electrical apparatus either in Zone-1, Zone-2 or hazardous area [within 30 Mtrs. as per OMR 2017(96(3))] of the mines shall comply with the provisions of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010. Explosion proof light fittings, all ac motors including VFD drilling motors (explosion proof), PBS and any other equipment should conform to the relevant standards.		
2	VFD drives for Draw works, Mud pump, Rotary drive, Top drive shall be same and inter-changeable.		
3	Supplier shall provide the maintenance schedule of all the equipment at the time of supply.		
4	If any motor/ generator are 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.		
5	Induced voltage on all plugs and receptacles for VFD motors shall be grounded adequately.		



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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).		
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6.0 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.

Drawing Package		Bidder's Offer	Deviation from BHEL Requirement
Three (03) sets of all the drawing shall be provided with			
1	Spare part manual along with PCR manufacturer's part number and Component manufacturer's part no. shall be submitted		
2	Equipment outline drawings		
3	Single line drawings		
4	Detailed VFD, Generator & Control Schematics		
5	Detailed control system Schematics(Electrical)		
6	Interconnection drawings		
7	Plug panel drawings		
8	Driller Cabin & other loose supply items drawings (electrical part)		
9	Bill of material of all the items & assemblies supplied		
10	Wiring list / drawings		
11	Dismantling and Assembly drawings		
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		



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13	Rig Earthing Schematic		
14	Cable schedule		
15	Details of all electrical equipment used in the rig, including Generators, motors, cables, light fittings, push button stations, plug & sockets,		
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		
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)		
18	Commissioned and final corrected "As built" Bill of Materials (BOM)		
19	Service manual of all equipment including air conditioners		
20	All drawings, service manual or any other document submitted to OIL shall be in English (USA or UK) language only		

7.0 SPARES :

- Commissioning spares: It is the responsibility of the bidder to provide adequate commissioning spares and consumables required during commissioning. Supplier to provide list of spares in the offer in spares section.
- Mandatory spares: The mandatory spares to be offered shall be as per list of spares given in spares section.
- Common (Capital) spares: The capital / common spares to be offered shall be as per list of spares given in spares section.
- Spares for **three years** normal operation (Other than what is specified in the tender and mentioned under AMC) of all equipment / system should be additionally included in the offer indicating item, part no. & quantity required. Item wise price of such spares should also be provided in commercial bid (price bid). Bidder should indicate the part nos. against each item along with OEM's part no. if any. The price of such spares shall not be revised for next **three (03)** years from the date of commissioning of first lot rigs and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years. Such spares will not be considered for bid evaluation.



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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.

8.0 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.		



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9.0 THE INSPECTION STRATEGY SHALL BE AS FOLLOWS:

		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	PCRs	√	√

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.



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3.1.7. DRILLER CABIN INCLUDING DRILLING CONTROL SYSTEM WITH CCTV AND INTERCOMM CONTROL SYSTEM & MP CONSOLE

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)		
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		



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	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.		
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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 be 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		



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	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		
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	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



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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 works 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		



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	parameters. The detail specification of the system is 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		



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	□ 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		
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	□ 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		
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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 should be supplied as per following details- I. Line balance assemble for Div2 area (01Nos) II. The Intercom (Microphone and Speaker) should be placed at least at following location: 1. DIC Room 2. Derrick Floor 3. Drillers Cabin 4. Pig House 5. VFD House 6. Monkey Board (portable) 7. AC PCR 8. Utility System 9. Assembly Point III. The system should be certified for used in drilling rigs as per Class1 Div2. IV. The system should have protecting Covers and proper installation fittings. V. Wall mounted system should be provided for DIC room and VFD house with 3mtr coil cable for microphone. VI. The system should have capability of public address.	



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	VII. Audio Visual alarms should be there for different conditions. VIII. Alarm System should have different tone for indication different situation on the rigs like: 1. General Alarms 2. Fire Alarm 3. LEL Alarms 4. H2S Alarm 5. Kick Alarms IX. All cables for Intercomm system shall be in Bidder's scope		
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4.0 CCTV SYSTEM :-

CCTV SYSTEM		Bidder's Offer	Deviation from BHEL Requirement
1	CCTV system for safety while operation and monitoring is to be provided .the details of the system is as follow. I. Camera: 6 Nos. II. Installation: Monkey Board (for vertical pipe handler), Derrick Floor Area, Shale Shaker Area and Cellar Pit Area, Near Inclined Walk (for cat walk), Mud Pump. III. Display Monitor (for displaying video output) IV. Control Unit for storage and control of the Camera v. The CCTV should be incorporated in the control system for ease of storage and transmission.		



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	VI. All cables for CCTV system to be bidder's scope of supply		
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a. TECHNICAL SPECIFICATION:

Technical Specification		Bidder's Offer	Deviation from BHEL Requirement
1	Camera: 1. Should be a pan/tilt/zoom 2. Should have certification for use in Hazardous Areas Zone 1 3. Should be fitted with explosion proof fittings 4. Should have Enclosure IP67 or higher 5. Operation Temp: 4 to 47 Deg. C 6. Capable for Day/Night Vision (Low flux) 7. Should have composite cable for power and signal; and all CCTV cables shall be routed separately in a channel/compartiment of cable trays (not along with power cables).		
2	Display Monitor 1. Should be able to display all the camera in split screen 2. Should be able to display a single camera 3. Should have certification for use in Hazardous Areas Zone 1 4. Operation Temp : 4 to 47 Deg. C		
3	Storage Server The storage unit must be placed inside the driller cabin		
4	Control Unit for camera Operation control for camera to be included in the drillers chair in cabin.		

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		



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	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.		



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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



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



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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.	
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3.1.8. RIG INSTRUMENTATION

Rig Instrumentation System

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	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.		

8.1 Scope of work

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Scope of Work		
8.1.1	Supply of PLC/SBC based 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 (server etc.) and software. Installation of all the hardware and software supplied under the present scope, hooking up all the sensors and connecting them with display unit and server through controller. Necessary cabling work shall be done to provide connectivity as required among Signal Processing Hardware, controller, Server and Display units. Finally, configuration of the total system for successful completion and commissioning. The work shall also include providing all inputs and details (like passwords, s/w codes etc.) of the system. The erection and commissioning team of the successful bidder shall be OEM /OEM trained personnel.		
8.1.2	Supply of Data Acquisition unit house (Bunk House) equipped with Two (2) Nos. of 1.5 T air conditioner (split type) having dimension of 12' (L) X 8'		



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	(W) X 8' (H) built on Oil field type ISMB 200 two runner skid as per the specification provided/ finalized with OIL for keeping the accessories like cable. The bunk must be equipped with table, storage locker and chairs. Cable entry to be on the side with rain protection cover.		
8.1.3	UPS provided for the Server shall be housed preferably in the Data Acquisition system in the Bunk House.		
8.1.4	Laying of necessary cables to connect the New Sensors and Top Drive Control Console to the Signal Processing Unit. Laying of Power cables for all components of the System, which require external Power Supply.		
8.1.5	Supply of metal box for safe transportation of sensors and cables		

8.2 General Requirement

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	General Requirement :		
8.2.1	The system should be enclosed in rugged, 304 SS enclosure (Console).		
8.2.2	The system should be capable of setting of different alarm limits as per the requirement of user.		
8.2.3	The system should use non-contacting type of sensors where ever it is possible.		
8.2.4	Double earthing provision to be given for DAQ bunk house.		

8.3 Cabling

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Cabling :		
8.3.1	All the Instrumentation signal cables used shall be shielded and shall be as per OEM recommendations/experience.		
8.3.2	Sensitive cables i.e., optical, Ethernet cable which are passing through damage prone area should be armoured.		
8.3.3	10% spare cable pairs/glands/connectors should be provided for future use.		
8.3.4	Cable glands shall be suitable for using at classified hazardous area.		
8.3.5	Nuts and bolts used for installation of field sensors shall be made of SS304.		
8.3.6	Wireless communication is to be used wherever it is possible/ admissible.		
8.3.7	Cables should have sufficient length to carrying out pad drilling 1+2 (min 30 m extra).		



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8.4 Rig floor information display panel

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Rig floor information display panel:		
8.4.1	The instrumentation system should be compatible to display all the drilling parameter on the screens available in the driller's cabin.		
8.4.2	All the drilling parameter which are stored in the system should be displayed at the drilling screen.		
8.4.3	The system should be able to show the different parameter in graphical as well as and button form with selectable channel.		
8.4.4	Rig Floor Information Panel is to be incorporated in side HMI screen and the requirement is not to be provided in separate panel.		

8.5 Drilling Parameters

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Drilling Parameters :		
8.5.1	Hook load		
8.5.2	W.O.B		
8.5.3	Stand Pipe Pressure		
8.5.4	Casing Pipe Pressure		
8.5.5	Tong Line Pull		
8.5.6	ROP		
8.5.7	Ton Mile		
8.5.8	Top Drive Torque		
8.5.9	Top Drive RPM		
8.5.10	Pump SPM(Pump1/Pump2/Pump3)		
8.5.11	Total SPM (Pump1+Pump2+Pump3)		
8.5.12	Pump Storks (Pump1/Pump2/Pump3)		
8.5.13	Total Stroke (Cumulative)		
8.5.14	Hole Depth		
8.5.15	Bit Position		
8.5.16	Tank Volume (all available mud tank)		
8.5.17	Active Tank Volume		
8.5.18	Total tank volume		
8.5.19	Loss/Gain Volume		
8.5.20	Trip Tank Volume		
8.5.21	Loss/Gain Trip Tank Volume		
8.5.22	Return Flow		
8.5.23	Mud Density In		
8.5.24	Mud Density OUT		
8.5.25	Mud Temperature In/Out		
8.5.26	Mud conductivity In		
8.5.27	Mud conductivity Out		
8.5.28	Total Gas At Shale Shaker		
8.5.29	Total Gas At Bell Nipple		
8.5.30	H2S Gas At Shale Shaker		
8.5.31	H2S Gas at Bell Nipple		
8.5.32	Iron Rough Neck Torque(optional)		



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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

8.6 Signal Processing Unit

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Signal Processing Unit :		
8.6.1	The signal processing system shall be a PLC/SBC based with controller.		
8.6.2	The remote I/O system must have a 10 spares I/O for future used in case of failure of any I/O.		
8.6.3	The Remote I/O system must provide intrinsically safe supply to all the sensors used in hazardous location.		
8.6.4	The connection between remote I/O and PLC/SBC should be through Optical fibre / Ethernet cable/wireless.		
8.6.5	The system must have capability for user defined algorithm to run for future use		

8.7 Data Storage System

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Data Storage System :		
8.7.1	All the well data real time and historical should be stored in the server. The provision should be given to view historical well data in the graphical format.		
8.7.2	Hot redundancy of data storage should be ensured. Two data storage running in parallel with one more system offline data storage system (also with hot redundancy).		
8.7.3	Data storage could be removed to take stored data to base office.		
8.7.4	In case of one of the data drive is taken out, the redundant data storage system should automatically become online and store data.		
8.7.5	System should automatically format data drive and ready to store data once the drive is put back in system.		
8.7.6	Data drive should be password protected for both transfer and formatting.		
8.7.7	The extracted data from drive should be in any of the data bases used widely in the industry such as SQL etc.		



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8.8 Networking & Software

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Networking & Software :		
8.8.1	One compatible Server of reputed make with minimum configuration dual processor , 16GB RAM, 17" LCD Monitor, 1 TB HDD (02 Nos.), FDD, DVD +/- RW (Re- Write), LAN card and Internal Modem are to be provided in the Instrumentation Bunk House. Server shall be Wi-Fi enabled. Server shall be provided with data backup facility. Licensed Windows based operating software, Antivirus Software and Drilling Application software shall also be provided with the server. The server shall be delivered ready to run, installed with well tested software of OEM .The server will be rack mounted type. The display, Key Board and Mouse shall also be either within the same rack LCD VDU shall be mounted in the cubicle. 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. Auto start and remote start facility should be there		
8.8.2	The server must have 5 years onsite OEM warranty with remote diagnosis		
8.8.3	Web based system for viewing of all the drilling parameter, equipment parameter should be available which can be accessed from DIC/MIC and EIC bunkhouse. Wireless connection should be there between instrumentation system/Control system and other PC for web base viewing.		
8.8.4	Calibration and Configuration Unit (Laptop) for the system should be supplied. Requisite calibrated application software to be loaded in the Laptop. The laptop shall be Wi-Fi (Wireless) LAN enabled. The Laptop should 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		
8.8.5	Server and the PLC/SBC should be connected to network through Ethernet/Optical cable. The server should be capable of Wi-Fi Wireless LAN connectivity in the future if required. The system should support the following features		
8.8.5.1	User friendly activity based HMI screens for Drilling, Tripping, Mud Screen, Digital Screens, Daily Log and configuration screens are to be designed as per OIL's requirement which shall be suitably designed and configured during detail engineering.		



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	The screens to be finalized after approval from OIL		
8.8.5.2	Display of all parameters on the server display unit should be in selectable multi screens, constructed in the following fashion:		
8.8.5.2.1	Minimum Seven parameters are to be displayed in either digital form or combination of digital and trend graph forms in a screen		
8.8.5.2.2	Minimum four trend graphs in vertical strip chart format in case only trend graphs are to be displayed in a screen with separate space for each graph. Menu driven operation		
8.8.5.2.3	Each screen should be capable of accommodating display of minimum seven parameters including minimum two trend graphs of vertical strip chart format (time/Depth on Y-axis and magnitude on X-axis). The trend graphs thus selected for display should show the historical trend for the selectable time period		
8.8.5.2.4	The minimum combination as above should cover the entire normal display area of the screen		
8.8.5.2.5	Parameter trend graph feature as desired above should be available		
8.8.5.2.6	Driller's Display Monitor should also be enabled with: User configurable display windows for various drilling parameters Alarm (Visual & audio alarm) set, for at least pit gain/loss, return flow, total gas and H2S gas		
8.8.6	All data collected by the system shall be time stamped either at the data acquisition unit or at the instrumentation server. Data transfer from the Server to the SCADA servers will be in WITSML format. All software's like the drilling applications supplied by the bidder shall support WITSML. Software should also support ODBC data archival of all parameters. Data storage up to two decimal places or more as per the technical requirement. Data shall be over written only after the predetermined time period		
8.8.7	Bidder shall provide all the necessary operating software along with License to operate the Server, Display Monitor, Discrete Digital Display Unit and Signal Processing Unit as applicable. The licenses of all software's supplied shall be in the name of OIL Ltd with lifetime validity		
8.8.8	Bidder shall configure all the parameters (drilling parameters plus Mud Chemistry Parameters) in suitable display screens in server monitor		
8.8.9	The server should be able to accept and store data from LWD, MWD, RSS, and Engine etc. via WITS/WITSML/MODBUS/Profibus/TCP-IP.		

8.9 Hardware for Hazardous area

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Hardware for Hazardous area:		
8.9.1	Bidder shall provide hardware suitable for use in Zone2, Class-I, Division-1 & 2, Group C&D with SIL		



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	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.		
8.9.2	The test certificates from relevant laboratory shall be submitted to the inspection agencies at the time of inspection at firm's premises, prior to dispatch of material		
8.9.3	The system certification should be such so as to enable OIL to hook up third party sensors certified by another agency without affecting the overall certification of the system		
8.9.4	The system should provide Intrinsically Safe power to all the sensors installed on the hazardous locations		

8.10 Documents

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Document to be provided :		
8.10.1	Single line diagrams of power supply distribution with make and ratings of components.		
8.10.2	Terminal block and external connection diagrams.		
8.10.3	Necessary information to purchaser for proceeding with the engineering work.		
8.10.4	The drawings / data which are required by purchaser during engineering stage will be submitted in 3 sets for information / comments / approvals as applicable.		
8.10.5	Six sets of packing lists and challans will be furnished.		
8.10.6	Six sets of O&M manuals, equipment catalogues and test certificates.		
8.10.7	Six sets of final drawings along with 1 set soft copy will be furnished.		
8.10.8	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 installed – 6 sets		
8.10.9	Factory Calibration Certificates, performance and test certificates.		
8.10.10	Technical documents namely Bill of Material (BOM).		
8.10.11	All the restore software, factory reset images and configurations to be provided after final commissioning.		

8.11 Project Specific Data Book & Certificates

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Includes three (3) sets of project-specific documentation, applicable product certification documentation, standard product manuals** and a CD of enclosed documentation. All information will be compiled in binders organized by section. Project specific documentation to include***		



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Project Specific Data Book & Certificates :			
8.10.1	Single line diagrams of power supply distribution with make and ratings of components.		
8.10.2	Terminal block and external connection diagrams.		
8.10.3	Necessary information to purchaser for proceeding with the engineering work.		
8.10.4	The drawings / data which are required by purchaser during engineering stage will be submitted in 3 sets for information / comments / approvals as applicable.		
8.10.5	Six sets of packing lists and challans will be furnished.		

**Note: The Project Data book manuals are in addition to the standard product manuals that are included with each item shipped.

***Note: Standard Language is English.

8.12 List of Calibration Equipment & Special Tools

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
List of Calibration Equipment & Special Tools:			
	All special tools/calibration equipments required shall be supplied. The following are the list of calibration equipment & special tools shall be supplied for each Rig.		
8.12.1	One (1) Fiber Optic Installation Tool Kit. All tools required, with instructions, to install ST or SC fibre optic connectors. Includes Continuity Test Set and Visual Fault Locator. The tool kit should include slicing tool along with the crimping tool for fibre optic cable. All required ST/SC connectors shall be provided.		
8.12.2	One (1) Calibration Adapter for LEL Sensors with LEL Gas cylinder		
8.12.3	One (1) Calibration Adapter for H2S Sensors		
8.12.4	One (1) SENSOR CALIBRATION HAND PUMP Kit with all the fittings for 10000PSI		
8.12.5	One (1) CALIBRATOR,VOLT/MA, With BATTERY AND CASE		
8.12.6	One (1) CALIBRATOR,MULTIFUNCTION,IS		
8.12.7	One (1) Field bus devices calibrator (Communication module along with the software for checking field bus devices using laptop)		
8.12.8	One (1) RJ-45 CRIMPING TOOL		
8.12.9	One (1) Digital Pressure Gauge (0-10000Psi resolution:1PSI) One (1) Digital Pressure Gauge (0-1000Psi resolution:0.01PSI) With test point fittings and hose		
8.12.10	One (1) mA SOURCE, FLUKE With BATTERY AND CASE		

8.13 List of Sensors

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
List of Sensors :			
8.13.1	Weight Indicator: Electronic weight indicator		



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	compatible with driller system With dual scale Ton(US) and Klbs.		
8.13.2	Ultrasonic Sensors for Mud Volume: Mud Pit Level Sensor, Ultrasonic		
8.13.3	Return Flow Sensor: Return flow sensor, Paddle type with different sizes of paddle		
8.13.4	SPM Sensor for Pumps: Proximity Type with proper explosion proof housing		
8.13.5	Pressure Transmitter Assembly: 1. Pressure Sensor, Weld Sub, 10K, H2S - For STP pressure 2. Pressure Sensor, Weld Sub, 10K, H2S - For Casing pressure		
8.13.6	Pressure Transducer, 5K: 1. Pressure to Current Transducer Assembly Output: 4-20 mA 2. Input: 5K Hydraulic Torque wrench		
8.13.7	Transducer Hook-Up Kit, Hydraulic, 10 ft. 5K Connects Pressure Transducer Box Assembly to source. Each kit contains: One (1) no. of 1. Tee One 2. Hose Assy., 5K PSI 10 ft. 3. Set Disconnects 4. Hydraulic Fluid each		
8.13.8	Transducer Hook-Up Kit, Electric Cable gland kit for Pressure Transducer assembly. Each kit contains: Two nos. of Gland, Cable 1/2" NPT, One no. of Bushing, Twelve nos. of Spare Terminal, 4 nos. of Screws with Nuts & Washers		
8.13.9	Type-D gauge for H-Manifold: Pressure gauge of 0-7500 PSI range type-D with 2" line pipe female end connection is to be supplied for installation on H-Manifold.		
8.13.10	Y-Connector- Change over adapter: 45 Degree Lateral Fitting, (2) fig 1502 female and (1) fig 1502 male connections Quantity: Two (2)		
8.13.11	Mud Density (preferably non-contact type) (In and OUT): Range: 0-2.5 g/cc, Temp: -20 to 60°C If submersible type is provided sensor should be have high accuracy and reliability with ease of maintenance. Mud temperature Measurement: Temp: 0 to 100°C		
8.13.12	Mud Conductivity Sensor (In and OUT): Range: 200/300 ms/cm		
8.13.13	Gas detection sensors 1, XMTR, LEL, EXP PRF, 0-100%, 3-WIRE ADAPTER, CALIBRATION FOR XMTR 2, XMTR, H2S, I.S., 0-100PPM ADAPTER, CALIBRATION FOR H2S		
8.13.14	Printer: One A3 size Laser colour Printer for printing Drilling trend is to supplied. The printer which is available in the Indian market is to be provided so that cartridge can be purchased when required from. Printer consumables (Cartridge and papers) should be provided		



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8.14 Installation, Calibration & Commissioning

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	Installation, Calibration & Commissioning :		
8.14.1	Bidder shall install the complete system. For this purpose all arrangements and all the inputs required at the rig site or at any place making all necessary clearance (including statutory DGMS clearance required if any), should be done by the Supplier		
8.14.2	Bidder shall Calibrate, Test and Commission the Instrumentation system after installation on the Rig. The bidder shall demonstrate the operation of all the displays, trending, Driller's Display Monitor screens, Tool Pusher Workstation screens etc, hardcopy printing of time and depth base logs to the satisfaction of the OIL engineers.		
8.14.3	Bidder shall provide required sufficient gas cartridges for calibration of LEL gas sensor and H2S sensors along with the operational spares during warranty period.		
8.14.4	All the sensors JB's and cable glands should be covered with the protecting covers/ Canopy for protection from rain and mud.		

8.15 Special Notes

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	8.15.1 Safety Compliance :		
8.15.1.1	All the above systems, Advanced Drilling Instrumentation system, Control System of Rig Equipments, 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.		
8.15.1.2	Bidder shall provide all system hardware along with field instruments/sensors suitable for use in Zone2, Class-I, Division-1 & 2, Group C&D with SIL 2/3 hazardous area as applicable for On-land drilling rigs. The certification for each unit and sensors to be used at classified hazardous area shall be from test facilities as mentioned in OMR 2017.		
8.15.1.3	All such test certificates, and approvals (if required) shall be submitted during FAT/inspection by OIL engineers.		

8.16 Installation & Commissioning Notes

	BHEL Requirements	Bidder's Offer	Deviation from BHEL'S requirements
	The installation and commissioning of all Rig Instrumentation systems of Complete Rig Package		



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	involves Two (2 Stage) Commissioning as described below		
	Installation, wiring and laying out of equipment		
8.16.1	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.		
	Initial commissioning after start up connection :		
8.16.2	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. Any modification/ rewiring etc. shall be carried out at this stage		
	Final commissioning :		
8.16.3	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.		



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3.1.9. IRON ROUGHNECK

IRON ROUGHNECK: One (1) No.

Iron Roughneck: Features & Specification			Bidder's Offer	Deviation from BHEL'S requirements
9.1	Pedestal mounted iron Roughneck to handle joint			
9.2	Control of Iron roughneck should be provided in driller's cabin (automatic) along with derrick floor (Manual)			
9.3	Automatic control of Iron Roughneck should be integrated with zone monitoring system of the Derrick floor			
9.4	Technical Specification			
9.4.1	Tubular OD	3½to 9. 3/4" (Fixture		
9.4.2	Torque Spin	3000 ft/lbs (minimum)		
9.4.3	Spin Speed (on 5" DP)	60 RPM (Min.)		
9.4.4	Makeup Torque	900,000ft-lbs(Min.)		
9.4.5	Break out Torque	120,000ft-lbs(Min.)		
9.4.6	Horizontal Adjustment	95" (Min.)		
9.4.7	Vertical Adjustment	36" (Min.)		
9.4.8	Connection Height	30" to 66"		
9.5	Positioning Pre-set: Well centre, Mouse hole, Wait on			
9.6	Mud splashing containment system should be preferably be Integral Part of Iron roughneck.			
9.7	Tool joint finder to enable automatic pre-positioning of			
9.8	Tightening torque should be measured and stored in the			
9.9	The Hydraulic Requirement shall be met by Centralised			
9.10	Provision for making and breaking up of bit (26, 23, 17			
9.11	Provision for making and breaking stabilizer. Range (26,			
9.12	Hazardous Area Classification: Zone 1 (complete Iron rough Neck)			



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3.1.10. HYDRAULIC CATWALK

Scope of Bidder and BHEL Hyderabad for manufacturing of Hydraulic catwalk. Bidder to confirm:

SL. NO.	BHEL SCOPE	Bidder's SCOPE	Bidder's Response
01	1. Main fabrication, assembly and testing of Hydraulic catwalk . 2. Procurement of direct bought out items including all hydraulic cylinders .	1. Supply of all hydraulic components and controls. This includes but not limited to, Winch, manual control, Wireless Controls, encoders, sensors and electrical drag chain with cables 2. Supply of complete manufacturing documentation (Drawings in Acad format, Technical process sheet, Schedule of Parts, Material Purchase specifications, Inspection & Test Procedure & O&M manual) for manufacturing, assembly and testing of AC Mud Pump at BHEL works. Documentation required is detailed at the end of the Technical specs, Section-3.1. 3. Supervisory support for manufacturing, assembly and testing at BHEL works	

HYDRAULIC CATWALK: One (1) No.

Hydraulic Catwalk: Features			Bidder's Offer	Deviation from BHEL'S requirements
10.1	One (1) Hydraulic Catwalk suitable for Rig floor height (minimum 35 Ft)			
10.2	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.			
10.3	Remotely operated hydraulic Gull wings shall be provided on both sides for aiding in the process of handling tubular from both sides.			
10.4	The unit complete with Pipe Indexers, hydraulic levelling jack, Tubular laydown shovel, emergency stop button strategically placed shall be provided			
10.5	V-door ramp functionality shall be maintained if Hydraulic catwalk control system is not working.			
10.6	Technical Specification			
10.6.1	Lifting capacity	10,000 lbs		
10.6.2	Tubular range	3000 ft/lbs (minimum)		
	Drill Pipe	2 3/8" thru 6 5/8" OD		
	Drill Collars	Upto 10" OD		
	Casing size	Upto 20" OD		
10.7	Hydraulic Catwalk Controls			
10.7.1	deleted			



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10.7.2	The unit shall also have provision for wireless remote operation control as well as from the unit		
10.8	Catwalk should have an inbuilt system to automatically measure pipe lengths and input to drilling control system for making pipe tally automatically.		

3.1.11. CENTRALISED HYDRAULIC POWER UNIT

Scope of Bidder and BHEL Hyderabad for manufacturing of Centralised HPU. Bidder to confirm:

SL. NO.	BHEL SCOPE	Bidder's SCOPE	Bidder's Response
01	1. Main fabrication, assembly and testing of AC Mud Pump. 2. Procurement of direct bought out items.	1. Supply of complete manufacturing documentation (Drawings in Acad format, Technical process sheet, Schedule of Parts, Material Purchase specifications, Inspection & Test Procedure & O&M manual) for manufacturing, assembly and testing of AC Mud Pump at BHEL works. Documentation required is detailed at the end of the Technical specs, Section-3.1.	

Hydraulic Power unit :

	BHEL Requirements	Bidder's offer	Deviation from BHEL Reqt.
	Hydraulic Power Unit (Electric Driven)		
11.1	All the rig accessories requiring hydraulic power shall be from common hydraulic power unit (except Mast raising cylinders) driven by electrical motor with standard controls		
11.2	The following shall be connected to the HPU: Iron rough neck, hydraulic cathead, hydraulic cat walk, Hydraulic power slip, Hydraulic BOP handling system, casing running tool and casing stabbing board.		
11.3	HPU unit shall be provided in acoustic enclosures		
11.4	Hydraulic Power Unit (Electric Driven): Features		
11.5.1	HPU with stainless steel hydraulic fluid tank, vibration dampeners and removable noise hood.		
11.5.2	Equipped with overload, single phase preventer of the electric motor, Earth leakage protection		
11.5.3	Automatic temperature control. The cooler starts automatically at an oil temp inside the tank of 38 deg C (100 deg F). The HP U unit automatically shuts down if the oil temperature inside the tank reaches 70 deg C (158 deg F). High and high-high fluid temperature alarm		
11.5.4	Automatic Oil level safety. Unit automatically shuts down if the oil level inside the tank is too low. Oil level monitor/alarm and operation control in the Drillers cabin		
11.5.5	Pressure and return connections with quick disconnect coupling		
11.5.6	Maximum pressure: 3000 psi (206.84 bar)		
11.5.7	Flow Rate: Bidder to Specify. (HPU shall be able to meet all hydraulic power requirement of above referred equipment)		
	Bidder shall provide suitable accumulator unit to meet		



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11.5.8	hydraulic power requirement so that all equipment can be operated with surge. Also suitable pressure regulators for each equipment's pressure requirement		
11.5.9	Return line equipped with contamination indicator. Offline fine-filter system		
11.5.10	Equipped with hot standby suitable dual pump-motor FLP. Secondary pump for 100% redundancy		
11.5.11	Ambient temperature: -6 deg C to +55 deg C		
11.5.12	Power supply (415 or 400V+/- 10%), 50 Hz with local control panel		
11.5.13	Tank volume: Approx. 1000 Gallons (Bidder to confirm)		
11.5.14	One manifold each for supply and return shall be provide at ODS side of suitable capacity with tapping provisions for all hydraulically operated equipment on and above derrick including hydraulic catwalk. Supply and return hydraulic lines of these equipment are to be connected from these manifolds.		
11.5	Independent reservoir for each system to be provided near the system to avoid surges		
11.6	HPU control with should be integrated with rig control system to facilitate operation from drillers control system		

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3.1.12. DRIVE MOTOR SPECIFICATIONS:

3.1.12.1 DRAW WORKS MOTOR: Draw Works Motors Specification	
3.1.12.1.1	AC drilling inverter duty rated, suitable for driving 2000 HP draw-works. Interchangeable with mud pump motor
3.1.12.1.2	Make: Refer section-3.6
3.1.12.1.3	Type: Ex-e, pressurized enclosure, suitable for use in hazardous Gas atmospheres, IP 44 (As per IS/IEC 60034-5).
3.1.12.1.4	Gas groups IIA & IIB
3.1.12.1.5	Quantity: Two (02) Number
3.1.12.1.6	Electrical rating: minimum 1100 HP.
3.1.12.1.7	RPM range at constant torque: To be specified by bidder
3.1.12.1.8	RPM range at continuous full horse power: To be specified by bidder
3.1.12.1.9	Temp. rise: T3 (200 C)
3.1.12.1.10	Duty: Continuous drive with constant torque, at 55 Deg. Centigrade
3.1.12.1.11	Stator insulation: Class H Vacuum Pressure Impregnated (VPI)
3.1.12.1.12	Bearing: Heavy duty anti friction bearing
3.1.12.1.13	Single shaft with hub
3.1.12.1.14	Main terminal box with IP56 protection minimum
3.1.12.1.15	Terminal box should be easily accessible for connection
3.1.12.1.16	Differential pressure switch (air flow relay/switch) for pressure sensing
3.1.12.1.17	Blower assembly with suitable capacity flameproof proof motor, 415 or 400 VAC, 50 Hz rated
3.1.12.1.18	Space heater
3.1.12.1.19	Motor electrical parameters to be provided by bidder
3.1.12.1.20	RTD provision for monitoring winding temperature with set of spare RTD
3.1.12.1.21	Maximum Torque: To be specified by bidder

3.1.12.2 ROTARY DRIVE : Rotary Drive Motors Specification	
3.1.12.2.1	AC drilling inverter duty rated, suitable for driving 2000 HP draw-works. Interchangeable with draw works & mud pump motor
3.1.12.2.2	Make: Refer section-3.6
3.1.12.2.3	Type: Ex-e, pressurized enclosure, suitable for use in hazardous Gas atmospheres, IP 44 (As per IS/IEC 60034-5)



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3.1.12.2.4	Gas groups IIA & IIB
3.1.12.2.5	Quantity: one (01) Number
3.1.12.2.6	Electrical rating: minimum 1100 HP.
3.1.12.2.7	RPM range at constant torque: To be specified by bidder
3.1.12.2.8	RPM range at continuous full horse power: To be specified by bidder
3.1.12.2.9	Temp. rise: T3 (200 C)
3.1.12.2.10	Duty: Continuous drive with constant torque, at 55 Deg. Centigrade
3.1.12.2.11	Stator insulation: Class H VPI
3.1.12.2.12	Bearing: Heavy duty anti friction bearing
3.1.12.2.13	Single shaft with hub
3.1.12.2.14	Main terminal box with IP56 protection minimum
3.1.12.2.15	Terminal box should be easily accessible for connection
3.1.12.2.16	Differential pressure switch (air flow relay/switch) for pressure sensing
3.1.12.2.17	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
3.1.12.2.18	Space heater
3.1.12.2.19	Motor electrical parameters to be provided by bidder
3.1.12.2.20	RTD provision for monitoring winding temperature with set of spare RTD
3.1.12.2.21	Maximum Torque: To be specified by bidder

3.1.12.3 TOP DRIVE MOTOR: Top Drive Motors Specification	
3.1.12.3.1	AC motor, inverter duty rated, suitable for torque requirement as mentioned in Top Drive Section 2.
3.1.12.3.2	Deleted
3.1.12.3.3	Type: Ex-e, pressurized enclosure, suitable for use in hazardous Gas atmospheres, IP 44 (As per IS/IEC 60034-5)
3.1.12.3.4	Gas groups IIA & IIB
3.1.12.3.5	Quantity: To be specified by bidder
3.1.12.3.6	Total minimum capacity: suitable to achieve torque range as mentioned in Top Drive Section ()
3.1.12.3.7	RPM range at constant torque: To be specified by bidder
3.1.12.3.8	RPM range at continuous full horse power: To be specified by bidder
3.1.12.3.9	Temp. rise: T3 (200 C)
3.1.12.3.10	Duty: Continuous drive with constant torque, at 55 Deg. Centigrade
3.1.12.3.11	Stator insulation: Class H VPI
3.1.12.3.12	Bearing: heavy duty roller bearing, re-greasable
3.1.12.3.13	Single shaft with hub
3.1.12.3.14	Main terminal box with IP56 protection minimum
3.1.12.3.15	Terminal box should be easily accessible for connection
3.1.12.3.16	Differential pressure switch (air flow relay/switch) for pressure sensing
3.1.12.3.17	Blower assembly with suitable capacity explosion proof motor, 415 or 600 VAC, 50/60 Hz rated
3.1.12.3.18	Space heater
3.1.12.3.19	The main motors and auxiliary motors positioning should be such that greasing inlet and outlet should be accessible in the rig up condition (if the motors are re-greasable)
3.1.12.3.20	Motor electrical parameters to be provided by bidder
3.1.12.3.21	RTD provision for monitoring winding temperature with set of spare RTD
3.1.12.3.22	Maximum Torque: To be specified by bidder

3.1.12.4 MUD PUMP DRIVE MOTORS: Mud Pump Motors Specification	
3.1.12.4.1	AC drilling Induction motor, inverter duty rated, suitable for driving rig pump specified in the Rig Pump section () Interchangeable with Draw works motor
3.1.12.4.2	Make: Refer section-3.6
3.1.12.4.3	Type: Ex-e, pressurized enclosure, suitable for use in hazardous Gas atmospheres, IP 44 (As per IS/IEC 60034-5)
3.1.12.4.4	Gas groups IIA & IIB
3.1.12.4.5	Quantity: 2 nos. per pump



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3.1.12.4.6	Electrical rating: minimum 1100 HP
3.1.12.4.7	RPM range at constant torque: To be specified by bidder
3.1.12.4.8	RPM range at continuous full horse power: To be specified by bidder
3.1.12.4.9	Temp. rise: T3 (200 C)
3.1.12.4.10	Duty: Continuous drive with constant torque, at 55 Deg. Centigrade
3.1.12.4.11	Stator insulation: Class H VPI
3.1.12.4.12	Bearing: Heavy duty anti friction bearing
3.1.12.4.13	single shaft with hub
3.1.12.4.14	Main terminal box with IP56 protection minimum.
3.1.12.4.15	Terminal box should be easily accessible for connection
3.1.12.4.16	Differential pressure switch (air flow relay/switch) for pressure sensing
3.1.12.4.17	Blower assembly with suitable capacity explosion proof motor, 415 or 400 VAC, 50 Hz rated
3.1.12.4.18	Space heater
3.1.12.4.19	The draw-works and rig pump motors shall be of the same make, model and power rating such that interchangeability of the motors is maintained
3.1.12.4.20	Motor electrical parameters to be provided by bidder
3.1.12.4.21	RTD provision for monitoring winding temperature with set of spare RTD
3.1.12.4.22	Maximum Torque: To be specified by bidder

3.1.12.5 STATUTORY REQUIREMENTS FOR THE VFD MOTORS: Statutory requirement for VFD Motors

3.1.12.5.1	The motors, all its auxiliaries & cable gland shall be suitable for use in oilfield hazardous area, Zone-I & Zone-II and Gas group II-A & II-B of oil mines and shall confirm to IS/IEC/EN: 60079-0:2011 & IS/IEC/EN: 60079-7/ IS/IEC/EN: 60079-2 .
3.1.12.5.2	Test reports 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.
3.1.12.5.3	In case the bidder is unable to provide the test reports at the time of bid submission, then the bidder has to categorically confirm in their offer that "Test reports will be submitted along with the supply of materials".

3.1.12.6 AUXILIARY MOTORS: Auxiliary Motors

3.1.12.6.1	Motors shall be rated for 415 or 400 Volts 3 phase AC, 50 Hz supply
3.1.12.6.2	All motors are to be flameproof, weather proof and conforming to minimum IP56 suitable for use in Zone 1 & 2, Gas groups IIA & IIB. Hazardous areas of oil mines
3.1.12.6.3	Motors shall be fitted with FLP/Exp double compression cable glands, terminal studs and earthing leads for connection to common earth bus. Plug-in type connections are not permissible at motor end.
3.1.12.6.4	Capacity: All auxiliary motors shall be per OEM design requirement, until otherwise specified
3.1.12.6.5	Motors electrical parameters: To be specified by the bidder
3.1.12.6.6	Make: Bharat Bijlee, Kirloskar, Marathon motors, Crompton Greaves, ABB, Cemp, Nidec, Siemens, LHP, WEG
3.1.12.6.7	As maximum efficiency of motor is achieved at 75% of rated load, the motor capacity (HP or KW) shall be designed accordingly.
3.1.12.6.8	All motors shall be supplied with local Push Button Station (PBS). The details of PBS has been included in section 9.5.3.10.3 of Electrical Specifications

3.1.12.7 STATUTORY REQUIREMENTS FOR THE AUXILIARY MOTORS: Statutory requirement for Auxiliary Motors

3.1.12.7.1	The motors, all its auxiliaries & cable gland shall be suitable for use in oilfield hazardous area, Zone-I or Zone-II or hazardous area [within 30 mtrs. as per OMR 2017(96(3))] and Gas group II-A & II-B of oil mines and shall confirm to IS/IEC/EN: 60079-0:2011 & IS/IEC/EN:60079-1:2007 shall confirm to the mentioned IS/IEC standards.
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3.1.12.7.2	Test reports 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.
3.1.12.7.3	In case the bidder is unable to provide the test reports at the time of bid submission, then the bidder has to categorically confirm in their offer that "Test reports will be submitted along with the supply of materials".

Documentations for Hydraulic BOP Cart, Hydraulic Catwalk, AC Mud Pump & Centralised HPU shall include but not limited to the following:

1. Supply of Design documentation that meets the requirement of technical specification in section 3.1.
2. Supply of Complete Manufacturing drawings in Auto CAD with detailed BOM.
3. Supply of Purchase specification for components or subassemblies to be outsourced.
4. Supply of Raw Material Purchase Specifications and manufacturing process sheets.
5. Supply of Assembly drawings
6. Supply of Assembly sequence, installation & Commissioning procedures with checkpoints.
7. Supply of foundation requirements.
8. Supply of O&M and spares parts Manuals.
9. Supply of any other information required by BHEL and/or end customer for carrying out manufacturing, assembly and testing at BHEL- Hyderabad facility and operation& maintenance by end customer.
10. Supply of Factory Acceptance / performance test procedure.
12. Necessary assistance during material selection by BHEL so that substantial local content is achieved.
13. Vendor to provide details of all the BOI's used in Mud pump.
14. The documentation to include drawings in AutoCAD format with detailed BOM, 3D models etc.



SECTION – 3.2

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



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**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:

SI 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 after spudding of 1 st well for particular rig, in case of any operational issue arises. 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.



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**TABLE-A : SCHEDULE OF INSTALLATION AND COMMISSIONING SUPPORT
FOR 2000HP RIGS – 5 NOS.**

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	Hydraulic cylinders for Mast & sub-structure raising & lowering with HPU and controls	By BHEL	By Supplier	By Supplier
7	Rig Instrumentation	By Supplier for 1 st rig	By Supplier	By Supplier
8	CCTV & INTERCOM System	By Supplier for 1 st rig	By Supplier	By Supplier
9	Centralised HPU	By BHEL	By Supplier for 1 st rig	By Supplier for 1 st rig
10	Hydraulic Catwalk	By BHEL	By Supplier for 1 st rig	By Supplier for 1 st rig
11	Hydraulic BOP cart	By BHEL	By Supplier for 1 st rig	By Supplier for 1 st rig
12	AC Mud Pump	By BHEL	By Supplier for 1st rig	By Supplier for 1st rig

Note: Bidder to work out Installation and Commissioning charges for BHEL Hyderabad and Commissioning support charges at M/S OIL rig site for complete 5 rigs package based on above scope of work. Bidder to then work out respective charges for each rig on pro-rata basis for filling up of price bid format.



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**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	AC Mud Pump
7	Centralised HPU and controls
8	Hydraulic Cat Head
9	Hydraulic Power slips
10	Casing Running Tool
11	Rig Instrumentation
12	CCTV & INTERCOM System
13	Independent Rotary Drive system
14	Hydraulic Cat Walk



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SECTION – 3.3

TRAINING OF M/S OIL & BHEL PERSONNEL



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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 three batches. Each batch shall consist of 13 rig personnel total 39 nos. (13 x 3 = 39 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	01 (One)
1.5.1.7	Rig Building Engineer & supervisor	03 (Three)
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, Hydraulic cylinders, hydraulic cat walk and Mud system	
1.6.1.3	Top Drive & controls	
1.6.1.4	Draw-works, Iron Rough Neck, Hydraulic Catwalk, BOP Cart	
1.6.1.5	Casing Running Tool	
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	



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		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
1.6.4.1	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 (SMP/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



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	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
	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	
	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	13	3
2	Rig operation and maintenance of equipment (Drilling, Rig building & Mechanical)	SMP/ OEM training facility in India	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)		05 days	6	2
5	Calibration Training (4 Elect./ 2 Instt)		03 days	6	2
6	On-site training after commissioning	Rig site	05 days	Rig crew	5

SMP – supplier's manufacturing plant



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SECTION – 3.4

SCOPE OF THIRD PARTY INSPECTION



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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.

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

1	Definitions & abbreviations	
1.1	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	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



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		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	--	



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		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 included in the manufacture data book.
			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)
	5.2	Detailed Scope of Work	



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		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 along with TPI agency
		5.2.2.1	Quality Manual: A document setting out the Manufacturer's Quality Policies, Systems, Procedures and practices, including a listing of procedures.
		5.2.2.2	Quality Control Plan / Inspection & Test Plan (ITP): A document specific to each item, detailing for each production / manufacturing operation.
		5.2.3	The details of tests to be conducted, test procedure to be followed and test certificate format with minimum and maximum limits of all parameters (as applicable) to be recorded during testing along with Inspection schedule of tests and duration shall be provided by manufacturer.
		5.2.4	The 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
			Hydraulic Catwalk
			Hydraulic Cylinders for raising of Mast & Substructure
			HPU & controls
			Hydraulic BOP Cart
			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.



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			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	--



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SECTION – 3.5

ADDITIONAL NOTES



Tender specifications for Pre-bid Tie-up for AC VFD Onshore Rig Equipment

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Additional Notes : Bidder to NOTE & Confirm

1. All major items shall be mounted on heavy duty self-loading skid used in oilfields.
2. OVERALL DIMENSION OF INDIVIDUAL ITEM HAVING SKID should not preferably exceed (including skid) 9.0 meter × 2.50 meter × 2.5 meter (L x W x H). However, for VFD House & Draw Works the same (including skid) may be up to **12.25 meter X 3.00 meter X 3.25 meter** (L x W x H) or as specified in respective equipment technical specifications. [Bidder to Confirm]
3. The overall weight of single individual item (with or without skid) including all accessories mounted on it and the skid as applicable should be as minimum as possible and should not preferably exceed 40.0 MT. However, weight of major items like VFD House, Draw Works, etc. to be confirmed. [Bidder to Confirm]
4. Equipment manufacturer shall decide about appropriate number of channels in the skid to be provided for proper equipment stability during operations and transportation.
5. **Suitable lifting lugs should be provided for each individual item.** 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)
6. **PAINTING INSTRUCTIONS (as applicable) :**
At least 3 coats after applying primer. Under Coating with Anti Corrosive Treatment for cement & rust and Top coat polyurethane paint. The preferred colour shade should be as follows:
 1. MAST (Bottom Section) - WHITE
 2. MAST (Top 20 ft. Section) - RED
 3. CROWN - RED
 4. RACKING BOARD - WHITE
 5. ALL HAND RAILS - YELLOW
 6. MUD PUMPS - BLUE
 7. MUD PUMP SKID - GREY
 8. DRAW-WORKS - BLUE
 12. VFD CONTROL ROOM - White

*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).



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7. 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.

8. SPARE PARTS:

Rig wise mandatory Spares, Common 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 three 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 three (03) years from the date of commissioning of first lot of rigs and BHEL can place orders at any time during this period on receipt of order from M/s OIL. **Cost of three 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.

9. 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.
- o 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:



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- 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

10. 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.



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SECTION – 3.6

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



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

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

SI	Equipment/Item	Company preferred by M/S OIL	BHEL Remarks
1	Mast & Substructure		BHEL
2	Drawworks		Successful Bidder to supply
3	Top Drive		
4	Drilling Control System		
5	Hydraulic Cylinder	-NA-	
6	Hydraulic Catwalk		
7	Crown Block		
8	Travelling Block		
9	Deadline Anchor		
10	Disc Brake (Auxiliary Draw-works Brake)	Eaton Corporation	
		National Oilwell Varco	
		Wichita Clutch, USA	
11	Shale Shakers, LMMC	Derrick Equipment Co., USA	
		National Oilwell Varco	
		MI Swaco	
12	Plug & socket: Connectors & receptacles for rig equipment	Pyle National USA (Amphenol)	
		BCH (Bhartia Cutler Hammer) Electrical Ltd	
		Emerson (Appleton), USA	
		Eaton (Crouse Hinds USA)	
13	Ex-D LED well glass Light Fittings /flood light	Flexpro, India	
		Emerson(Appleton), USA	
		Baliga, India	
		Flame proof India(FCG), India	
14	Elevator link	National Oilwell Varco - Varco BJ	
		FORUM Blohm + Voss Oil Tools GmbH/BVOT Germany	
15	AC VFD drilling motor (except Top drive AC VFD motor)	General Electric, USA	
		ABB (BALDOR)	
16	Advanced Rig Instrumentation & Sensors	National Oilwell Varco	
17	VFD panels(including convertor)	Siemens, Germany	
		ABB, Switzerland	
18	MCC panel components (Including Soft Starter, ACB,MCB,ELCB,ELR,OLR)	General Electric	
		Siemens	



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		ABB	
		Allen-Bradley	
		Group Schneider	
19	High Pressure Gauges	Cameron Instruments,	
		National Oilwell Varco	
		Oteco Inc, USA	
		Wagner Instruments, USA	
20	Rotary Hose	Dunlop Argentina	
		Phoenix Beattle	
		Gates Corporation	
		Contitech Rubber Industrial	
21	Casing Running Tool	National Oilwell Varco	
		Baker Hughes	
		Tesco	
		Weatherford	
22	Mud Pump	Garden Denver	Mfg. by BHEL with Design of bidder/OEM
		National Oilwell Varco	
		Mh Wirth, Germany	
		Drill Mec	
23	Power & control cables as (Not applicable for VFD & other special communication cables)	Universal CablesLtd, India	
		RSCC Wire and Cable, USA	
		General Cable, USA	
		Nicco Corporation Limited	
		CCI (Cable Corporation of	
		IMT Cables, India	
		Radiant Cables	
		Huber & Schuner, Switzerland	

Criteria for selection of manufacturers for bought out items.

- Item at Sl. no 5-9: Item to be supplied in compliance to evaluation criteria as per Clause 6 of Section-1.
- Item at Sl. no 10-**23**: Item to be supplied from above preferred vendors OR alternately in compliance to evaluation creation as per Clause 6 of Section-1.



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SECTION – 3.7

DRAWINGS AND DOCUMENT SUBMISSION SCHEDULE



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3.6 DRAWINGS AND DOCUMENT SUBMISSION SCHEDULE :

3.6.1 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) Outline general arrangement drawings indicating overall dimensions of the equipment offered for following major equipment: -
 - Mast and Substructure with Hydraulic raising arrangement.
 - AC Draw works
 - AC Top Drive
 - VFD House (PCRs)
 - Driller Cabin
 - AC Mud pumps
 - Iron Rough Neck
 - Hydraulic Catwalk
 - Centralized HPU etc
 - ULMCC
 - LMSS
 - BOP Cart
- ii) Technical leaflet / catalogs of the offered other equipment.
- iii) Technical details of the Mud Pump, Mast, Substructure & Crown Block and 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
 - o All principal dimensions of Major components
 - Rig-up & rig-down sequence.
 - Layout drawing of all Substructure components with details of load distribution.
- x) Foundation & site layout drawings with load bearing capacity / distribution for various components of Mast & Substructure covering the following:
 - Assumed parameters of design of CC / RCC foundations shall be furnished.
 - The Safe Bearing Capacity (CBC) of soil may be assumed as 8 Tonne/ sq.mtr. (1486 lbs/sq.ft.) for design of the CC / RCC foundations.
 - All design for foundation shall confirm to BIS - 456:2000.
 - For machine Foundation the code to be followed are IS-2974 7 is 13301 respectively.

3.6.2 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.



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SECTION – 3.8

LIST OF SPARES



Tender specifications for Pre-bid Tie-up for AC VFD Onshore Rig Equipment

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SECTION-3.8.A: RIG WISE MANDATORY SPARES FOR SUPPLIED EQUIPMENT

Bidder to quote for rig wise mandatory spares as per Appendix 3.8A (to be considered for evaluation)

List of Mandatory Spares

Sl. No.	Equipment/Spare Part Description	Used in	Qty.
Equipment :			
3.8.A.1.1	DW/ MP/IRD AC motor	AC drives	02 No.
3.8.A.1.2	Blower unit (for drilling motor)	AC drilling motors	02 No.
3.8.A.1.3	Soft starter	PCR starter panels	01 No.
3.8.A.1.4	Air Conditioner, Ex type	Driller's Cabin	01 No.
3.8.A.1.5	Lube oil motors (if used)	Mud Pump / Draw Works	01 No.
3.8.A.1.6	Blower motor assembly for resistor bank (refer specification for Brake Resistor assy in PCR 1&2 specifications, in case a standby blower is not provided with the brake resistor then an additional blower is to be supplied and qty will be 02 nos in that case)	Resistor bank	01 No
Devices and consumables :			
3.8.A.2.1	Control fuses of each type / rating	PCR, Drillers cabin, MP console	10 nos.
3.8.A.2.2	Fuse holder set of each type (base and carrier)	PCR	02 no.
3.8.A.2.3	Control switches of each type	PCR, Drillers cabin, MP consol	01set
3.8.A.2.4	Indicating meters of each type	PCR, Drillers cabin, MP consol	01 set
3.8.A.2.5	Control pots of each type	PCR, Drillers cabin, MP consol	01 set
3.8.A.2.6	Control relays of each type (Other then used in MCC)	PCR, Drillers cabin, MP consol	02 set
3.8.A.2.7	Contactors of each type (Other then used in MCC)	PCR, Drillers cabin, MP consol	02 nos.
3.8.A.2.8	Diodes for rectifier section	PCR	02 sets
3.8.A.2.9	Power fuse and control for diodes (rectifier section) of each type/rating	PCR	02 sets
3.8.A.2.10	DC link components	PCR	01 set
3.8.A.2.11	Critical spare for rectifier unit (PCB of each type (if any), HMI)	Rectifier panel	04 set
3.8.A.2.12	Critical spare for Inverter/ VFD unit module (PCB of each type, HMI)	Inverter Panel	06 set
3.8.A.2.13	Power and control fuse for VFD inverter/ unit of each type/rating	PCR	06 nos.
3.8.A.2.14	Air circuit breaker/MCCB of each type (Other then used in MCC)	PCR – generator/ rectifier/ inverter/transformer panels	01 no.
3.8.A.2.15	Control module for air circuit breaker of each type	PCR- generator/rectifier/ inverter/ transformer panels	01 no.
3.8.A.2.16	Generator Panel spares (PCB of each type, Fuse of each type)	Generator panel	02 set
3.8.A.2.17	Generator control module	Generator panel	02 Nos.
3.8.A.2.18	PCB of each type for MPcon/ Ground fault	MPcon/ D'con/ Ground fault/ synchronizing	02 set



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		panel	
3.8.A.2.19	Control/ regulating transformer of each type (Other then used in MCC)	PCR- generator/ rectifier/ inverter/transformer / MPcon/ D'con/ Ground fault	01 no.
3.8.A.2.20	MCCB for AC motor starters of each Type	PCR starter/ feeder Panels	01 no.
3.8.A.2.21	Contactors for AC motors of each Type	PCR starter/ feeder Panels	01 no.
3.8.A.2.22	Overload relays of each type	PCR starter/ feeder Panels	05 nos.
3.8.A.2.23	RCD of each type	PCR starter/ feeder Panels	02 nos.
3.8.A.2.24	Indication lamps of each type and colour (Other then used in MCC)	PCR , D'con, MPcon	10 set
3.8.A.2.25	HMI screen for generator panel	Generator panel	02 Nos.
3.8.A.2.26	HMI screen for monitoring	PCR	01 Nos.
3.8.A.2.27	Selector switch of each type	Generator panel/ MP consol etc.	10 Nos.
3.8.A.2.28	Components of synchronizing system	Synchronizing panel	01 set
3.8.A.2.29	Electrical components of drillers cabin (PCB of each type, Switch of each type, Joystick, potentiometer etc)	Drillers cabin	2 set
3.8.A.2.30	Soft starter of each type	PCR	01 No
3.8.A.2.31	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) Note : MCC portion spare plugs and sockets shall be in BHEL scope of supply	PCR, PCR, D'con, MPcon, socket board of 250 KVA genset and isolation & lighting transformer hut.	12 nos.
3.8.A.2.32	Emergency lamp	PCR	02 Nos.
3.8.A.2.33	PCR anti panic lock set	PCR	02 Nos.
3.8.A.2.34	ACB for standby generator incomer	PCR	1 No
Field sensors and Consumables :			
3.8.A.3.1	Weight Indicator	Instrumentation System	01 no.
3.8.A.3.2	Ultrasonic Sensors for Mud Volume	Instrumentation System	01 no.
3.8.A.3.3	Return Flow Sensor	Instrumentation System	01 no.
3.8.A.3.4	SPM Sensor for Pumps	Instrumentation System	01 no.
3.8.A.3.5	Pressure Transmitter Assembly: 1. Pressure Sensor, Weld Sub, 10K, H2S - For STP pressure 2. Pressure Sensor, Weld Sub, 10K, H2S - For Casing pressure	Instrumentation System	01 set
3.8.A.3.6	Pressure Transducer, 5K: 1. Pressure to Current Transducer Assembly Output: 4- 20 mA 2. Input: 5K Hydraulic Torque wrench	Instrumentation System	01 set
3.8.A.3.7	Transducer Hook-Up Kit, Hydraulic, 10 ft. 5K Connects Pressure Transducer Box Assembly to source. Each kit contains: One (1) no. of 1. Tee One 2. Hose Assy., 5K PSI 10 ft. 3. Set	Instrumentation System	01 set



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	Disconnects 4. Hydraulic Fluid each		
3.8.A.3.8	Transducer Hook-Up Kit, Electric Cable gland kit for Pressure Transducer assembly. Each kit contains: Two nos. of Gland, Cable 1/2" NPT, One no. of Bushing, Twelve nos. of Spare Terminal, 4 nos. of Screws with Nuts & Washers	Instrumentation System	01 set
3.8.A.3.9	Type-D gauge for H-Manifold: Pressure gauge of 0-7500 PSI range type-D with 2" line pipe female end connection is to be supplied for installation on H-Manifold.	Instrumentation System	01 set
3.8.A.3.10	Y-Connector- Change over adapter 45 Degree Lateral Fitting, (2) fig 1502 female and (1) fig 1502 male connections	Instrumentation System	01 no.
3.8.A.3.11	Mud Density (preferably non-contact type)	Instrumentation System	01 no.
3.8.A.3.12	Mud Conductivity Sensor (In and OUT)	Instrumentation System	01 no.
3.8.A.3.13	Gas detection sensor - LEL	Instrumentation System	01 no.
3.8.A.3.14	Gas detection sensor - H ₂ S	Instrumentation System	01 no.
3.8.A.3.15	Camera	CCTV system	02 nos.
3.8.A.3.16	Cables used for Camera system	CCTV system	100 Meter
3.8.A.3.17	Cable Glands	CCTV system	10 nos.
3.8.A.3.18	Connectors (Male and Female)	CCTV system	10 sets
3.8.A.3.19	Intercom (Microphone and speaker)	Intercom/PA system	2 sets
3.8.A.3.20	Cables used for Intercom system	Intercom/PA system	150 Meter
3.8.A.3.21	Cable Glands	Intercom/PA system	10 nos.
3.8.A.3.22	Connectors (Male and Female)	Intercom/PA system	10 sets
3.8.A.3.23	All field sensors used for monitoring and control in Drawworks	Drawworks	1 set
3.8.A.3.24	All field sensors used for monitoring and control in TDS	Top Drive System	1 set
3.8.A.3.25	All field sensors used for monitoring and control in Mud Pumps	Mud Pumps	1 set
3.8.A.3.26	All field sensors used for monitoring and control in Iron Roughneck	Iron Roughneck	1 set
3.8.A.3.27	All field sensors used for monitoring and control in Hydraulic Cathead	Hydraulic Cathead	1 set
3.8.A.3.28	All field sensors used for monitoring and control in Pipe Handler	Pipe Handler	1 set
3.8.A.3.29	All field sensors used for monitoring and control in Hydraulic Catwalk	Hydraulic Catwalk	1 set
3.8.A.3.30	All field sensors used for monitoring and control in HPU	HPU	1 set



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SECTION-3.8.B: COMMON MANDATORY SPARES FOR SUPPLIED EQUIPMENT

Bidder to quote for common mandatory spares as per Appendix 3.8B (to be considered for evaluation)

The following spares shall be supplied commonly for all the five (05) VFD rigs:

Sl. No.	Equipment/Spare Part Description	Used in	Quantity to be delivered with 1 st lot of rigs	Quantity to be delivered with last lot of rigs
Equipment :				
3.8.B.1.1	VFD Inverter module	VFD panel	01 Nos.	02 Nos.
3.8.B.1.2	Power transformer (600/415 VAC)	PCR	01 Nos.	02 Nos.
3.8.B.1.3	PLC/ SBC/PAC system spares	Control Panel in PCR	01 Set	01 Set
3.8.B.1.4	AC of each type for PCRs	PCR	02 Nos.	01 No.
3.8.B.1.5	Special maintenance tools for the drilling motors (as recommended by motor OEM)	VFD drilling motor	02 Sets	
3.8.B.1.6	Top Drive AC VFD Motor	Top Drive	01 No.	
3.8.B.1.7	Top Drive Blower Motor	Top Drive	01 No.	01 No.
3.8.B.1.8	Top Drive Hydraulic Motor	Top Drive	01 No.	01 No.
3.8.B.1.9	Top Drive Cables (From PCR to TOP Drive Unit)	Top Drive	01 Set	
Devices and consumables :				
3.8.B.2.1	Data Acquisition System	Drilling Instrumentation System	03 Sets	
3.8.B.2.2	Data Storage System/Server (Preinstalled software with license)	Drilling Instrumentation System	03 Sets	
3.8.B.2.3	Workstation	Drilling Instrumentation System	03 Sets	
3.8.B.2.4	Monitors	Drilling Instrumentation System	03 Sets	
3.8.B.2.5	UPS	Drilling Instrumentation System	03 Sets	
3.8.B.2.6	Rig Floor Information Display Panel in Drillers Cabin	Drilling Instrumentation System	03 Sets	
Spares of PLC/ SBC/PAC/Any other Control systems to be used to Control of the following systems of the Rig from Driller Cabin				
3.8.B.2.7	Drawworks Control Module	Drawworks	03 Sets	
3.8.B.2.8	Top Drive Control Module	Top Drive System	03 Sets	
3.8.B.2.9	Mud Pump Control Module	Mud Pumps	03 Sets	
3.8.B.2.10	Iron roughneck Control Module	Iron Roughneck	03 Sets	
3.8.B.2.11	Hydraulic Cathead Control Module	Hydraulic Cathead	03 Sets	
3.8.B.2.12	Hydraulic Catwalk Control Module	Hydraulic Catwalk	03 Sets	
3.8.B.2.13	HPU Control Module (PLC/ SBC/PAC system)	HPU	03 Sets	
3.8.B.2.14	Intercom/Public Address system Control Module	Intercom/PA system	03 Sets	
3.8.B.2.15	CCTV system controller	CCTV system	03 Sets	



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3.8.B.2.16	CCTV Display Monitor	CCTV system	03 Sets	
3.8.B.2.17	Integrated HMI display panel	Drillers Cabin	03 Sets	

SECTION-3.8.C: OPERATIONAL SPARES FOR **THREE** YEARS

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

Spares for **three** 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

- The price of such spares shall not be revised for next **3** years from the date of commissioning of each rig along with the availability of spares for next 10 years.
- The quoted spares are adequate for **3** years of operation of the supplied equipment. They will supply additional spares free of cost, if required during **3** years of operation.
- 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-3.8.D: COMMISSIONING SPARES

Bidder to quote for commissioning spares in the format given in Appendix 3.8D 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.



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SECTION – 3.9

ANNUAL MAINTENANCE CONTRACT



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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 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	LOT -1 (RIG -1 AND RIG-2)		LOT - 2 (RIG -3 AND RIG -4)		LOT 3 (RIG -5)
		AMC COST PER RIG	AMC COST FOR TWO RIGS	AMC COST PER RIG	AMC COST FOR TWO RIGS	AMC COST PER RIG
YEAR-1	TOP DRIVE SYSTEM (TDS)					
	CASING RUNNING TOOL					
	ELECTRICAL EQUIPMENTS					
	RIG INSTRUMENTATION					
	IRON ROUGH NECK					
	HYDRAULIC CATWALK					
YEAR-2	TOP DRIVE SYSTEM (TDS)					
	CASING RUNNING TOOL					
	ELECTRICAL EQUIPMENTS					
	RIG INSTRUMENTATION					
	IRON ROUGH NECK					
	HYDRAULIC CATWALK					
YEAR-3	TOP DRIVE SYSTEM (TDS)					
	CASING RUNNING TOOL					
	ELECTRICAL EQUIPMENTS					
	RIG INSTRUMENTATION					
	IRON ROUGH NECK					
	HYDRAULIC CATWALK					
YEAR-4	TOP DRIVE SYSTEM (TDS)					
	CASING RUNNING TOOL					
	ELECTRICAL EQUIPMENTS					
	RIG INSTRUMENTATION					
	IRON ROUGH NECK					
	HYDRAULIC CATWALK					



3.9.1 AMC-TOP DRIVE SYSTEM (TDS):

3.9.1.1 SCOPE OF WORK:

ON-SITE maintenance, troubleshooting and support service for **5 sets of TDS** and controls of newly procured OIL's 5 numbers of 2000 VFD rigs which includes but not limited to the following:

- a) Supervisory services shall be provided during rig-up, rig-down & inter location movement.
- b) Supervisory services for maintenance, troubleshooting & providing support services during course of a well for keeping the complete TDS packages in good health.
- c) Familiarizing the rig crew with the complete equipment/systems and imparting hands-on training for basic operation, troubleshooting and maintenance.
- d) Rectification of any problems, abnormalities, anomalies and defects noticed/logged during the course of a well, so that there shall be uninterrupted drilling activity.
- e) Preparation of inventory and spares list.
- f) The service provider shall have to carry out maintenance of the bought out items also installed in the TDS package or arrange for the services required from the OEM of such items.
- g) The service provider shall arrange for hiring / summoning the services of technical experts in case site engineer is unable to rectify/ troubleshoot a particular problem, at no extra cost to OIL.
- h) In case any defect or functional anomaly is noticed/predicted during any maintenance activity, or pointed out by Oil India, SERVICE PROVIDER shall rectify the same to the complete satisfaction of Oil India.
- i) The AMC shall also cover maintenance of systems/equipment's 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) Transportation, Accommodation, food, boarding & lodging will NOT be provided by OIL and that is the service provider's scope.



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3.9.1.2 SPARES & CONSUMABLES:

- a) Bidder to **recommend/offer** spares for **three** 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 (as per Appendix-3.9). Bidder should indicate the part nos. against each item along with OEM's part no., if any. The cost of **these** spares will **not** be considered for price comparison. The price of such spares shall not be revised for next **3** years from the date of **commissioning of first lot of rigs** and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years.
- b) **Deleted**
- c) Replaced defective spares, **if any** shall be deposited to Oil India Limited.

3.9.1.3 SPECIAL TOOLS/CALIBRATORS:

- a) The Service Provider shall arrange for all the tools & tackles and instruments for carrying out the maintenance & troubleshooting of the TDS & Controls. Any special tools and instruments required for maintenance & troubleshooting shall be arranged by the service provider without any extra cost to OIL.
- b) OIL's own existing workshop facility will be made available to SERVICE PROVIDER for carrying out the maintenance, repair, calibration & troubleshooting. In case any other W/S facility (in excess of that presently available with Oil India) is required, SERVICE PROVIDER shall arrange for the same at his own cost.

3.9.1.4 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-4 times, Half-yearly-2times, Yearly-once.
3	Equipment Test/Calibration/Breakdown reports	Whenever equipment /Spares etc. are repaired/ replaced with new ones.
4	Commissioning / Re-deployment report for all equipments under AMC.	At the beginning of every new location to be drilled.



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- 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

3.9.1.5 MANPOWER:

The Service Team shall comprise of qualified and experienced service personnel as per Following details.

Sl. No.	Purpose of visit	Service Team	
		Service Engineer	Technician
1	Rig Move (Rig-up & Rig-down)	1 No.	1 No.
2	Quarterly Maintenance	2 Nos.	1 No.
3	Half-yearly Maintenance	2 Nos.	1 No.
4	Yearly Maintenance	2 Nos.	1 No.
5	Troubleshooting (On call basis)	As per requirement (To be decided depending on the nature of repair work)	As per requirement (To be decided depending on the nature of repair work)

a) Service Engineer

- Should have a Degree preferably in Instrumentation/Electrical/Mechanical Engineering with a minimum of 3 years experience or Diploma preferably in Instrumentation/Electronics/Mechanical Engineering with a minimum of 5 yrs. experience as an Engineer in Diesel Electric (AC-VFD) drilling rigs.
- Should have sound knowledge of TDS system& controls and have experience of carrying out maintenance of such systems.
- Should be confident in independently carrying out troubleshooting, fault finding analysis, rectification of fault, configuration, operation and maintenance of all the items & field instruments/sensors of TDS of (AC-VFD) drilling rigs.
- Should be conversant with Oil Mines Regulations and OISD.

b) Technician:

- Must be diploma with minimum 3 yrs. Experience or ITI preferably in Instrumentation/Electronics/Mechanical with minimum 5 yrs. Experience respectively in the operation and maintenance of diesel electric (AC-VFD) drilling rigs.
- Should have sound knowledge of TDS system& controls.

c) Note:

- The service provider may deploy unskilled helper as and when required with prior permission from OIL.
- An undertaking from Contractor's all personnel should be submitted to Company after deployment of manpower prior to commencement of



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work/completion of mobilization, denouncing any claim on employment or any service benefit from OIL.

- iii The personnel deployed by the Contractor should comply with all the safety norms applicable during operation.
- iv Medical Fitness: The Contractor shall ensure that all of the Contractor's Personnel shall have a full medical examination (by a qualified and registered doctor) prior to commencement of the Drilling operation and the certificates of all such personnel in form 'O' of The Mines Act 1952 should be submitted by the contractor.

d) Training Courses:

- i) The Contractor shall ensure that all of the Contractor's Personnel performing services hereunder shall have attended all relevant safety and operational training courses such as Mines Vocational Training (MVT), First Aid Certificate course (FAC), Fire Fighting (FF), etc. required by "The Mines Act 1952" & "OISD Guidelines" and as is generally consistent with international petroleum industry practice and/or as otherwise required by the Company.
- ii) The Contractor shall submit copies of all such certificates prior to mobilization & also keep such records at well site.

e) Approval Of Manpower:

- i Contractor shall have to obtain prior approval from the Company before deployment of personnel in the rig. Applications seeking approval for deployment shall be submitted to GM- Drilling Operation and shall be forwarded to concerned department for scrutiny.
- ii The following documents shall have to be submitted along with the letter seeking approval.
 - a. Bio-data of the candidate with photograph.
 - b. Photo copy of relevant pass certificates and other proficiency certificate.
 - c. Copy of experience certificates (original to be produced on demand).
- iii Bidder shall furnish bio-data of key personnel with their photographs along with the techno-commercial bid of the AMC.
- iv The Company reserves the right to instruct the Service provider for removal of any Service provider's personnel who in the opinion of the Company is technically not competent or not rendering the services faithfully, or due to other reasons. However, the replacement personnel also must have the qualification/experience as indicated above. The Service provider should submit qualification/bio-data /photographs/experience/track record of the replacement personnel and obtain prior approval from the Company for their deployment. Replacement of personnel will be fully at the cost of the Contractor and shall be made by the Contractor within ten (10) days of such instruction.



3.9.2 AMC-HYDRAULIC CATWALK

3.9.2.1 SCOPE OF WORK:

ON-SITE maintenance, troubleshooting and support service for 5 sets of **Hydraulic Catwalks** and controls of newly procured OIL's 5 numbers of 2000 VFD rigs which includes but not limited to the following:

- a) Supervisory services shall be provided during rig-up, rig-down & inter location movement.
- b) Supervisory services for maintenance, trouble shooting & providing support services during course of a well for keeping the complete Hydraulic Catwalk packages in good health.
- 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 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) Transportation, Accommodation, food, boarding & lodging will NOT be provided by OIL and that is the service provider's scope.



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3.9.2.2 SPARES & CONSUMABLES:

- a) Bidder to **recommend/offer** spares for **three** 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 (as per Appendix-3.9). Bidder should indicate the part nos. against each item along with OEM's part no., if any. The cost of **these** spares will **not** be considered for price comparison. The price of such spares shall not be revised for next **3** years from the date of **commissioning of first lot of rigs** and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years.
- b) **Deleted**
- c) Replaced defective spares, **if any** shall be deposited to Oil India Limited.

3.9.2.3 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 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.

3.9.2.4 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 of reporting
1	PM Schedule for all equipment's of Hydraulic Catwalk	Once, at the start of the contract.
2	Maintenance Activity	Quarterly-4 times, Half-yearly-2times, Yearly-once.
3	Equipment Test/Calibration/Breakdown reports	Whenever equipment /Spares etc. are repaired/ replaced with new ones.
4	Commissioning / Re-deployment report for all equipment under AMC.	At the beginning of every new location to be drilled

- d) **Safety:** All safety procedures and guidelines are to be followed at all the time when in Drilling site. Providing proper safety appliances such as safety boots, helmets, hand gloves and protective clothing etc. to their personnel shall be Service Provider's responsibility.



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- 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
- OIL Safety and Environment guidelines

3.9.2.5 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 Nos.	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

- Should have a Degree preferably in Instrumentation/Electrical/Mechanical Engineering with a minimum of 3 years experience or Diploma preferably in Instrumentation/Electronics/Mechanical Engineering with a minimum of 5 yrs. experience as an Engineer in Diesel Electric (AC-VFD) drilling rigs.
- Should have sound knowledge of Hydraulic Catwalk system& controls and have experience of carrying out maintenance of such systems.
- 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.
- Should be conversant with Oil Mines Regulations and OISD.

b) Technician:

- 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 diesel electric (AC-VFD) drilling rigs.
- Should have sound knowledge of Hydraulic Catwalk system& controls.

c) Note:

- The service provider may deploy unskilled helper as and when required with prior permission from OIL.
- An undertaking from Contractor's all personnel should be submitted to Company after deployment of manpower prior to commencement of



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work/completion of mobilization denouncing any claim on employment or any service benefit from OIL.

- iii The personnel deployed by the Contractor should comply with all the safety norms applicable during operation.
- iv Medical Fitness: The Contractor shall ensure that all of the Contractor's Personnel shall have a full medical examination (by a qualified and registered doctor) prior to commencement of the Drilling operation and the certificates of all such personnel in form 'O' of The Mines Act 1952 should be submitted by the contractor.

d) Training Courses:

- i) The Contractor shall ensure that all of the Contractor's Personnel performing services hereunder shall have attended all relevant safety and operational training courses such as Mines Vocational Training (MVT), First Aid Certificate course (FAC), Fire Fighting (FF), etc. required by "The Mines Act 1952" & "OISD Guidelines" and as is generally consistent with international petroleum industry practice and/or as otherwise required by the Company.
- ii) The Contractor shall submit copies of all such certificates prior to mobilization & also keep such records at well site.

e) Approval Of Manpower:

- i Contractor shall have to obtain prior approval from the Company before deployment of personnel in the rig. Applications seeking approval for deployment shall be submitted to GM- Drilling Operation and shall be forwarded to concerned department for scrutiny.
- ii The following documents shall have to be submitted along with the letter seeking approval.
 - a. Bio-data of the candidate with photograph.
 - b. Photo copy of relevant pass certificates and other proficiency certificate
 - c. Copy of experience certificates (original to be produced on demand).
- iii Bidder shall furnish bio-data of key personnel with their photographs along with the techno-commercial bid of the AMC
- iv The Company reserves the right to instruct the Service provider for removal of any Service provider's personnel who in the opinion of the Company is technically not competent or not rendering the services faithfully, or due to other reasons. However, the replacement personnel also must have the qualification/experience as indicated above. The Service provider should submit qualification/bio-data /photographs/experience/track record of the replacement personnel and 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.



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3.9.3 AMC-IRON ROUGHNECK

3.9.3.1 SCOPE OF WORK:

ON-SITE maintenance, troubleshooting and support service for **5 sets of Iron Roughnecks** of newly procured OIL's 5 numbers of 2000 VFD rigs, which includes but not limited to the following:

- a) Familiarizing the rig crew with the complete equipment/system and imparting hands-on training for basic operation, troubleshooting and maintenance.
- b) Supervisory services shall be provided during rig-up and rig-down.
- c) Supervisory services for maintenance, trouble shooting & providing support services during course of a well for keeping the Iron Roughneck packages in good health.
- d) Rectification of any problems, abnormalities, anomalies and defects noticed/logged during the course of a well, so that there shall be uninterrupted drilling activity.
- e) Preparation of inventory and spares list.
- f) The service provider shall have to carry out maintenance of the bought out items also installed in the Iron Roughneck package or arrange for the services required from the OEM of such items.
- g) The service provider shall arrange for hiring / summoning the services of technical experts in case site engineer is unable to rectify/ troubleshoot a particular problem, at no extra cost to OIL.
- h) In case any defect or functional anomaly is noticed/predicted during any maintenance activity, or pointed out by Oil India, SERVICE PROVIDER shall rectify the same to the complete satisfaction of Oil India.
- i) The AMC shall also cover maintenance of systems/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 etc.
- k) The service team shall be fully conversant with the Iron Roughneck system & controls. They should be physically fit for working in the well site. The service personnel(s) shall also be able to work with their own hands.
- l) The manpower & tools including OIL's own workshop facility, if required for carrying out the maintenance & trouble shooting, will be made available by OIL.
- m) The Service Provider shall provide a detailed maintenance check list detailing OIL INDIA LTD's responsibility on Daily/weekly maintenance of the Iron Roughnecks.
- n) The personnel(s) of service provider should preferably be Indian citizens and fully trained by service provider to carry out the AMC.
- o) Transportation, Accommodation, food, boarding & lodging will NOT be provided by OIL and that is the service provider's scope.

3.9.3.2 SPARES & CONSUMABLES:

- a) Bidder to **recommend/offer** spares for **three** 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 (as per Appendix-3.9). Bidder should indicate the part nos. against each item along with



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OEM's part no., if any. The cost of these spares will not be considered for price comparison. The price of such spares shall not be revised for next 3 years from the date of commissioning of first lot of rigs and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years.

- b) Deleted
- c) Replaced defective spares, if any shall be deposited to Oil India Limited.

3.9.3.3 SPECIAL TOOLS/CALIBRATORS:

- a) The Service Provider shall arrange for all the tools & tackles and instruments for carrying out the maintenance & troubleshooting of the Iron Roughnecks & Controls. Any special tools and instruments required for maintenance & troubleshooting shall be arranged by the service provider without any extra cost to OIL.
- b) OIL's own existing workshop facility will be made available to SERVICE PROVIDER for carrying out the maintenance, repair, calibration & troubleshooting. In case any other W/S facility (in excess of that presently available with Oil India) is required, SERVICE PROVIDER shall arrange for the same.

3.9.3.4 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	PM Schedule for all equipment's of Iron Roughneck	Once, at the start of the contract.
2	Maintenance Activity	Quarterly-4 times, Half-yearly-2times, Yearly-once.
3	Equipment Test/Calibration/Breakdown reports	Whenever equipment /Spares etc. are repaired/ replaced with new ones.
4	Commissioning / Re-deployment report for all equipment under AMC.	At the beginning of every new location to be drilled

- d) **Safety:** All safety procedures and guidelines are to be followed at all the time when in Drilling site. Providing proper safety appliances such as safety boots, helmets, hand gloves and protective clothing etc. to their personnel shall be Service Provider's responsibility.
- e) **Statutory Compliance:** All relevant provisions of the following (or the latest amendments there to) shall comply by the Service Provider to this AMC, as well as personnel deployed-
- OMR, 2017
 - OISD standards



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- DGMS guidelines
- CPCB / APCB environment and anti-pollution guidelines
- OIL Safety and Environment guidelines

3.9.3.5 MANPOWER:

The Service Team shall comprise of qualified and experienced service personnel as per following details.

Sl. No.	Purpose of visit	Service Team	
		Service Engineer	Technician
1	Rig Move (Rig-up & Rig-down)	1 No.	1 No.
2	Quarterly Maintenance	NIL	1 No.
3	Half-yearly Maintenance	NIL	1 No.
4	Yearly Maintenance	1 No.	1 No.
5	Troubleshooting (On call basis)	As per requirement (To be decided depending on the nature 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/Electronics/Mechanical Engineering with a minimum of 5 yrs. experience as an Engineer in Diesel Electric (AC-VFD) drilling rigs.
- ii. Should have sound knowledge of Iron Roughneck system& controls and have experience of carrying out maintenance of such systems.
- iii. Should be confident in independently carrying out troubleshooting, fault finding analysis, rectification of fault, configuration, operation and maintenance of all the items & field instruments/sensors of Centrifuge of (AC-VFD) drilling rigs.
- iv. Should be conversant with Oil Mines Regulations and OISD.

b) Technician:

- i) Must be diploma with minimum 3 yrs. Experience or ITI preferably in Instrumentation/Electrical/Mechanical with minimum 5 yrs. Experience respectively in the operation and maintenance of Iron Roughneck in diesel electric (AC-VFD) drilling rigs.
- ii) Should have sound knowledge of Iron Roughneck system& controls.

c) Note:

- i The service provider may deploy unskilled helper as and when required with prior permission from OIL.
- ii An undertaking from Contractor's all personnel should be submitted to Company after deployment of manpower prior to commencement of work/completion of mobilization denouncing any claim on employment or any service benefit from OIL.
- iii The personnel deployed by the Contractor should comply with all the safety norms applicable during operation.



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- iv Medical Fitness: The Contractor shall ensure that all of the Contractor's Personnel shall have a full medical examination (by a qualified and registered doctor) prior to commencement of the Drilling operation and the certificates of all such personnel in form 'O' of The Mines Act 1952 should be submitted by the contractor.

d) Training Courses:

- i) The Contractor shall ensure that all of the Contractor's Personnel performing services hereunder shall have attended all relevant safety and operational training courses such as Mines Vocational Training (MVT), First Aid Certificate course (FAC), Fire Fighting (FF), etc. required by "The Mines Act 1952" & "OISD Guidelines" and as is generally consistent with international petroleum industry practice and/or as otherwise required by the Company.
- ii) The Contractor shall submit copies of all such certificates prior to mobilization & also keep such records at well site.

e) Approval of Manpower:

- i Contractor shall have to obtain prior approval from the Company before deployment of personnel in the rig. Applications seeking approval for deployment shall be submitted to GM- Drilling Operation and shall be forwarded to concerned department for scrutiny.
- ii The following documents shall have to be submitted along with the letter seeking approval.
 - a) Bio-data of the candidate with photograph.
 - b) Photo copy of relevant pass certificates and other proficiency certificate
 - c) Copy of experience certificates (original to be produced on demand).
- iii Bidder shall furnish bio-data of key personnel with their photographs along with the techno-commercial bid of the AMC
- iv The Company reserves the right to instruct the Service provider for removal of any Service provider's personnel who in the opinion of the Company is technically not competent or not rendering the services faithfully, or due to other reasons. However, the replacement personnel also must have the qualification/experience as indicated above. The Service provider should submit qualification/bio-data /photographs/experience/track record of the replacement personnel and 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 EQUIPMENTS OF 5 NOS. OF 2000 HP VFD RIGS:

3.9.6.1 SCOPE OF WORK:

The scope of work for AMC in broad sense shall be periodic as well as breakdown maintenance of all the Electrical equipment of 5 nos. of 2000 HP VFD Rigs including the TOP Drive system but excluding Air Conditioning system.

- i) Onsite maintenance, troubleshooting & providing support services in keeping the complete rig Electrical system in operational and in good working condition.



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- 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.

3.9.6.2 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 equipment).
- ~~iv) Rig alternators (Power Packs).~~
- iv) Alternator control system.
- ~~v) Transformers.~~
- vi) DC bus sections (DC Power Distribution).
- vii) Rectifier sections.
- viii) Diode Supply Units.
- ix) HMI and Operating Console of Driller's Cabin.
- x) Electrical system of Hydraulic Control Station.
- ~~xi) All Auxiliary AC motors and their associated starter/feeder panels (LT Power utilization & Distribution).~~
- ~~xii) Soft starter panels including the soft starters and associated contactors/relays.~~
- xiii) Drilling motors (Mud Pump Motors, Draw Works Motors, IRD Motor, Auto Drill motors, Top drive motors and associated blower and lube motors).
- xiv) VFD / Inverter panels.
- xv) 600 VAC Power Distribution.
- xvi) Dynamic braking system including brake choppers and resistors.
- ~~xvii) NGR System, including NGR Monitor, resistances and panel devices.~~
- ~~xviii) Socket Boards and connected switchgears.~~
- ~~xix) LT distribution system and Lighting system which includes Mast Lighting system, Mud tank area lighting and Area Lighting system.~~

B. Broad activities under Maintenance:

Electrical maintenance activities outlined below covers the Electrical AMC in broad sense. Please note that these are minimum prescribed maintenance activities. All other activities (e.g. OEM recommended maintenance) under this AMC shall be in addition to these prescribed minimum activities.

1. Maintenance of items/systems/equipment / processes listed out under para A "Scope" above. This shall include periodic (quarterly, half yearly and yearly etc.) and breakdown maintenance services (on call basis).
2. Maintenance of the rig control system including sub-systems, input/output modules, remote modules, re-programming or modification of the control system software as per drilling operational requirement etc.
3. Rectification of any problems, abnormalities, anomalies and defects noticed/logged during the course of a well operation at full/rated/part load. This will cover Troubleshooting & rectification/ replacement of defective parts/setting/adjustment/calibration of limits in the control system/ drives etc.



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4. Supervisory services will be required during drilling operation, rig-up, rig-down & inter location movement in proper way.
5. Any other maintenance activity required for uninterrupted operation of the rigs.

C. Spares & consumables:

- a) Bidder to **recommend/offer** spares for **three** 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 (as per Appendix-3.9). Bidder should indicate the part nos. against each item along with OEM's part no., if any. The cost of **these** spares will **not** be considered for price comparison. The price of such spares shall not be revised for next **3** years from the date of **commissioning of first lot of rigs** and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years.
- b) **Deleted**
- c) Replaced defective spares, **if any** shall be deposited to Oil India Limited.

D. Tools / Tackles & Workshop Facilities:

1. The Service Provider shall arrange for all the tools & tackles and instruments for carrying out the maintenance & troubleshooting of the Electrical system. Any special tools and instruments required for maintenance & troubleshooting of Electrical system shall be arranged by the service provider without any extra cost to OIL.
2. Oil India will only provide facility for lifting / handling / carrying heavy equipment.
3. OIL's own existing workshop facility (presently available at the Rig) will be made available to SERVICE PROVIDER for carrying out the maintenance & trouble shooting. In case any other W/S facility (in excess of that presently available with Oil India) is required, SERVICE PROVIDER shall arrange for the same.

E. Reports:

SERVICE PROVIDER shall provide the following reports to OIL, as per frequency indicated against each report / document:

Sl. No	Description of Reports	Frequency of reporting
1	PM Schedule for all equipments covered under Para "11.10.6.2 A SCOPE " above	Once, at the start of the contract.
2	Maintenance Activity	Quarterly-4 times, Half-yearly-2times, Yearly-once.
3	Drawing Changes or alterations changes made to circuits, equipment with approval from OEM.	As and when such occur.
4	Equipment Test reports	Whenever equipment /Spares etc. are replaced with new ones.
5	Commissioning / Re-deployment report for all equipment under AMC	At the beginning of every new location to be drilled



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F. Quality of maintenance:

1. All instruments, equipment etc. proposed to be used under this AMC should be calibrated, and copies of all such certificates to be provided to OIL on demand. SERVICE PROVIDER shall ensure that such certificates remain valid for the duration of the AMC.
2. In case any cable / wires are replaced, its original ID tag should be restored.
3. No safety device / provision should be by-passed or jumpered. In case such action is absolutely necessary, it shall be removed as soon as the situation has been normalized.
4. Service provider shall carry out the maintenance as per the Original manufacturer recommendation.
5. Frequent break down /poor performance of the machine shall be analyzed by qualified /expert /competent engineer without any extra cost to OIL.

G. Safety during carrying out maintenance activities:

Contractor shall ensure that a system of Electrical shutdown permit (permit to carry out Electrical work), hot work/cold work permit is employed as required.

1. Statutory provisions:

All relevant provisions of the following (or the latest amendments there to) shall apply to this AMC, as well as personnel deployed under this AMC:

- i) CEA (Measures relating to safety and electric supply) regulations, 2010
- ii) OMR, 2017
- iii) OISD standards
- iv) DGMS guidelines
- v) CPCB / APCCB 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/equipment's newly added or replaced during operational or statutory requirements.

I. Personnel to be deployed:

1. SERVICE PROVIDER shall provide personnel for maintenance, troubleshooting & providing support services in keeping the complete rig packages in good health.
2. All necessary trained man power required under the AMC shall have to be arranged by the service provider. OIL will only provide support staff for rig up/rig down of the equipment as and when required.
3. The Service Team shall comprise of qualified and experienced service personnel as per following details.

Sl. No.	Purpose of visit	Service Team	
		Service Engineer	Technician
1	Rig Move (Rig-up & Rig-down)	1 No.	1 No.
2	Quarterly Maintenance	1 No.	1 No.
3	Half-yearly Maintenance	1 No.	1 No.
4	Yearly Maintenance	1 No.	1 No.
5	Troubleshooting (On call basis)	As per requirement (To be decided depending on the nature of repair work)	As per requirement (To be decide)



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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

9. NOTE:

- a) An undertaking from Contractor's all personnel should be submitted to Company after deployment of manpower prior to commencement of work/completion of mobilization, denouncing any claim on employment or any service benefit from OIL.
- b) The personnel deployed by the Contractor should comply with all the safety norms applicable during operation.
- c) Medical Fitness: The Contractor shall ensure that all of the Contractor's Personnel shall have a full medical examination (by a qualified and registered doctor) prior to commencement of the Drilling operation and the certificates of all such personnel in form 'O' of The Mines Act 1952 should be submitted by the contractor.
- d) Training Courses:
 - i) The Contractor shall ensure that all of the Contractor's Personnel performing services hereunder shall have attended all relevant safety and operational training courses such as Mines Vocational Training (MVT), First Aid Certificate course (FAC), Fire Fighting (FF), etc. required by "The Mines Act 1952" & "OISD Guidelines" and as is generally consistent with international petroleum industry practice and/or as otherwise required by the Company.
 - ii) The Contractor shall submit copies of all such certificates prior to mobilization & also keep such records at well site for the
- e) The service provider may deploy unskilled Electrical helper as and when required with prior permission from OIL.

f. APPROVAL OF MANPOWER: Contractor shall have to obtain prior approval from the Company before deployment of personnel in the rig. Applications seeking approval for deployment shall be submitted to CGM- Drilling-Operation and shall be forwarded to concerned department for scrutiny.

The following documents shall have to be submitted along with the letter seeking approval:

- i. Bio-data of the candidate with photograph.
- ii. Photo copy of relevant pass certificates and other proficiency certificate
- iii. Copy of experience certificates (original to be produced on demand).
- iv) Bidder shall furnish bio-data of key personnel with their photographs along with the techno-commercial bid



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- v) The Company reserves the right to instruct the Service provider for removal of any Service provider's personnel who in the opinion of the Company is technically not competent or not rendering the services faithfully, or due to other reasons. However, the replacement personnel also must have the qualification/experience as indicated above. The Service provider should submit qualification/bio-data /photographs/experience/track record of the replacement personnel and obtain prior approval from the Company for their deployment. Replacement of personnel will be fully at the cost of the Contractor and shall be made by the Contractor within ten (10) days of such instruction

The supplier of the Rigs shall provide Annual Maintenance Contract (AMC) with Oil India Limited, **four (4) years (after completion of warranty period)** ON-SITE maintenance, troubleshooting and support service for the complete rig instrumentation and control systems of the supplied Rig.

3.9.7 AMC-RIG INSTRUMENTATION:

3.9.7.1 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, trouble shooting & providing support services in keeping the complete rig packages in good health.
- b) Maintenance of the rig instrumentation & control system including sub-systems, input/output modules, remote modules, re-programming or modification of the control system software as per drilling requirement etc.
- c) Familiarizing the instrumentation crew with the above mentioned equipment's/systems and imparting hands-on training for basic troubleshooting and maintenance.
- d) Rectification of any problems, abnormalities, anomalies and defects noticed/logged during the course of a well, so that there shall be uninterrupted drilling activity.
- e) Preparation of inventory and spares list.
- f) The service provider shall have to do maintenance of the bought out items also installed in the rig package or arrange for the services required from the OEM of such items.
- g) The service provider shall arrange for hiring / summoning the services of technical experts in case site engineer is unable to rectify/ troubleshoot a particular problem, at no extra cost to OIL.
- h) In case any defect or functional anomaly is noticed/predicted during any maintenance activity, or pointed out by Oil India, SERVICE PROVIDER shall rectify the same to the complete satisfaction of Oil India.
- i) The AMC shall also cover maintenance of systems/equipment newly added or replaced during operational or statutory requirements.
- j) Supervisory services shall be provided during rig-up, rig-down & inter location movement in proper way whenever asked for.



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- k) The scope of AMC for instrumentation items should include the complete instrumentation and control system.
- l) The spares required for maintenance will either be provided by OIL or will be procured (if required urgently) from the service provider.
- m) List of all spares required for maintenance of instrumentation and control system along with price shall be provided by the supplier and the same shall be provided upon delivery.
- n) For maintenance and troubleshooting of rig instrumentation & controls one qualified expert Instrumentation Engineer (Educational Qualification: BE) of minimum 2 years' experience in the relevant field shall be employed.
- o) The maintenance package shall include services of one the instrumentation engineer along with provision of all special tools, tackles instruments and calibrators.
- p) The person shall be fully conversant with the complete system of rig instrumentation & control system. He should be physically fit for working in the well site. He shall also be able to work with his own hands.
- q) The manpower & tools including OIL's own workshop facility required for carrying out the maintenance & trouble shooting will be made available by OIL.
- r) The personnel(s) of service provider should preferably be Indian citizens and fully trained by service provider to carry out the AMC.
- s) Transportation, Accommodation, food, boarding & lodging will NOT be provided by OIL and that is the service provider's scope.

3.9.7.2 SPARES & CONSUMABLES:

- a) Bidder to **recommend/offer** spares for **three** 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 (as per Appendix-3.9). Bidder should indicate the part nos. against each item along with OEM's part no., if any. The cost of **these** spares will **not** be considered for price comparison. The price of such spares shall not be revised for next **3** years from the date of **commissioning of first lot of rigs** and OIL can place orders at any time during this period. Bidders must confirm the same along with the availability of spares for next 10 years.
- b) **Deleted**
- c) Replaced defective spares, **if any** shall be deposited to Oil India Limited.

3.9.7.3 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.

3.9.7.4 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.



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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-4 times, Half-yearly-2times, Yearly-once.
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.
5	Commissioning / Re-deployment report for all equipment under AMC	At the beginning 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
- OIL Safety and Environment guidelines

3.9.7.5 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:



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- 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.

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.



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- b) Photo copy of relevant pass certificates and other proficiency certificate
- c) Copy of experience certificates (original to be produced on demand).
- iii) Bidder shall furnish bio-data of key personnel with their photographs along with the techno-commercial bid of the AMC
- iv) The Company reserves the right to instruct the Service provider for removal of any Service provider's personnel who in the opinion of the Company is technically not competent or not rendering the services faithfully, or due to other reasons. However, the replacement personnel also must have the qualification/experience as indicated above. The Service provider should submit qualification/bio-data /photographs/experience/track record of the replacement personnel and obtain prior approval from the Company for their deployment. Replacement of personnel will be fully at the cost of the Contractor and shall be made by the Contractor within ten (10) days of such instruction.



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SECTION – 4

DELIVERY SCHEDULE OF EQUIPMENT



Tender specifications for Pre-bid Tie-up for AC VFD Onshore Rig Equipment

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EQUIPMENT WISE MATERIAL DELIVERY SCHEDULE – FOB BASIS				
Rig Type →		2000 HP (5 nos.)		
Sl.	Item Description	1 st lot – within 9 months from BHEL PO date	2 nd lot – within 9 months from BHEL PO date	3 rd lot – within 9 months from BHEL PO date
1	Draw-works	2 Sets	2 Sets	1 Set
2	Top Drive along with Elevator link	2 Sets	2 Sets	1 Set
3	Items for PCR 1,2,&3 (VFD House & Drives)	2 Sets [^]	2 Sets [^]	1 Set [^]
4	Drillers Cabin & Drilling control system, CCTV System & Intercom	2 Sets	2 Sets	1 Set
5	Iron Rough Neck	2 Sets	2 Sets	1 Set
6	AC Mud Pump*	6 sets [^]	6 sets [^]	3 sets [^]
7	IRD AC motor	2 Sets [^]	2 Sets [^]	1 Set [^]
8	Hydraulic cylinders for Mast & sub-structure	2 Sets	2 Sets	1 Set
9	Rig Instrumentation	2 Sets	2 Sets	1 Set
10	Centralised HPU*	2 Sets [^]	2 Sets [^]	1 Set [^]
11	Hydraulic Catwalk*	2 Sets [^]	2 Sets [^]	1 Set [^]
12	Hydraulic BOP cart*	2 Sets [^]	2 Sets [^]	1 Set [^]
13	Commissioning Spares	2 sets	2 sets	1 set
14	Common mandatory spares (Common for 5 rigs)	Set of spares as per Section 3.8.B for 1 st lot of rigs	-	Set of spares as per Section 3.8.B with last lot of rigs
15	Mandatory spares for each rig	2 sets	2 sets	1 set
16	Design Documentations of mast, substructure , Crown Block and accessories	Complete set within one month after placement of order	-	-

*** All Documents to be supplied within one month after placement of order for manufacturing of items by BHEL.**

[^] Materials to be supplied within 6 months after placement of order for manufacturing of items by BHEL.



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EQUIPMENT WISE INSTALLATION, COMMISSIONING & TRAINING SCHEDULE				
Rig Type →		2000 HP (5 nos.)		
Sl.	Item Description	1 st lot – within 16 months from BHEL PO date	2 nd lot – within 16 months from BHEL PO date	3 rd lot – within 13 months from BHEL PO date
1	Draw-works	2 Sets	2 Sets	1 Set
2	Top Drive	2 Sets	2 Sets	1 Set
3	VFD House & Drives	2 Sets	2 Sets	1 Set
4	Drillers Cabin & Drilling control system, CCTV System & Intercom	2 Sets	2 Sets	1 Set
5	Iron Rough Neck	2 Sets	2 Sets	1 Set
6	Hydraulic cylinders for Mast & sub-structure raising & lowering with HPU and	2 Sets	2 Sets	1 Set
7	Rig Instrumentation	2 Sets	2 Sets	1 Set
8	Centralised HPU	2 Sets	2 Sets	1 Set
9	Hydraulic Catwalk	2 Sets	2 Sets	1 Set
10	Hydraulic BOP cart	2 Sets	2 Sets	1 Set
11	AC Mud Pump	6 sets	6 sets	3 sets



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SECTION – 5

PRICE BID FORMATS



Tender specifications for Pre-bid Tie-up for AC VFD Onshore Rig Equipment

Specification No. OE57146 Rev-02

1. Price bid Format of 2000 HP Capacity Rig Equipment (Technical specification Section – 3.1)– Material portion - 5 rigs

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	2000 HP AC Draw works with motors	1				
M2	500T AC Top drive system	1				
M3	AC VFD House with AC Drives & Control (Items package for PCR1,2 &-3 as per technical spec.)	1 set				
M4	Driller control Cabin with HMI, Joy stick & Drilling controls system and Intercom & CCTV system	1 set				
M5	Rig Instrumentation System	1 set				
M6	AC Mud Pump (Item package as per technical spec.)	3 sets				
M7	AC motor for IRD	1 no.				
M8	Hydraulic system (including Hydraulic Cylinders) HPU and its operator control /console for raising and lowering of mast and sub structure	1 set				
M9	Hydraulic Catwalk (Item package as per technical spec.)	1 set				
M10	Iron roughneck	1				
M11	Hydraulic BOP Cart (Item package as per Technical spec.)	1 set				
M12	Grand Total of (C) Ex-works Material Value per rig (Sum of M1 to M11)					
M13	Lump sum Pre-dispatch Inspection Charges of above equipment (Sl No M1 to M11) thru TPI per rig					
M14	Lump sum Packing & FOB Charges of above equipment (Sl No M1 to M11) per rig					
M15	Total FOB value of complete Material up to nearest seaport per rig (M15 = M12+M13+M14)					
M16	Total FOB value of complete Material up to nearest sea port for 5 rigs					



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	(M16 = M15 * 5)	
M17	Grand Total Z1 of Rig wise mandatory spares for 5 rigs as per Section 3.8.A	
M18	Grand Total Z2 of Common mandatory spares for 5 rigs as per Section 3.8.B	
M19	Grand Total Z4 of Commissioning spares of equipment's for 5 rigs as per Section 3.8.D	
M20	Lump sum Packing & FOB Charges of Spares (for M17 to M19) for 5 rigs	
M21	Total FOB Value of Spares up to nearest sea port for 5 rigs $M21 = (M17+M18+M19+ M20)$	
T1	Grand total FOB Value of complete material including spares up to nearest sea port for 5 Rigs $T1 = (M16 + M21)$	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 Common 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. Commissioning spares quantity should be suitable for 5 rigs.



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2. Price bid Format of of 2000 HP Capacity Rig Equipment (Technical Specification Section – 3.1) – Service Charges – 5 rigs

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 (SI No. M1-M11 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 (SI No M1-M11 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 3 RD party equipment as specified in Table-B of Section 3.2.	1 set		
S4	Lump sum Training Charges for 117 man days for M/S OIL engineers at Bidders (OEM) training facility (Bidder scope of work shall be as per Section 3.3)	117 man days		
S5	Lump sum Training Charges for 43.2 man days for M/S OIL engineers at SMP / OEM (Bidder) training facility in India (Bidder scope of work shall be as per Section 3.3)	43.2 man days		
S6	Lump sum Onsite Training charges for 5 days for M/S OIL rig crew at M/S OIL rig site in India (Bidder scope of work shall be as per Section 3.3)	5 days		
S7	Total service charges per rig for Installation, Commissioning and Training (S7 = S1+S2+S3+S4+S5+S6)			
T2	Grand Total of service charges for 5 rigs (T2 = S7 * 5)	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.



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3. Price bid Format for supply of Documentation for Mast & Substructure and Centralised HPU
(Technical Specification Section – 3.1)

Sl. No.	Description	Qty. (A)	Unit Rate in USD (B)	Total Price in USD (C=A*B)
S8	One time documentation charges for Mast & Substructure to be manufactured by BHEL as per design documentation of bidder	1 set		
S9	One time documentation charges (if any) for Centralised HPU to be manufactured by BHEL as per design documentation of bidder	1 set		
T3	Grand Total of one time documentation charges for Mast & Substructure & Centralised HPU T3=S8+S9	Total in USD (Figures) Total in USD (Words)		

4. 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)
S10	Total cost of four (04) years non-comprehensive (without spares) AMC (for Five (05) rigs)	1		
S11	Taxes, if any, on S10	1		
T4	Grand Total 4 years AMC charges for 5 rigs (without spares) T4=S10+S11	Total in USD (Figures) Total in USD (Words)		



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5.	<u>GENERAL CONDITIONS FOR PRICE BID :</u>
5.1	Prices should be quoted on FIRM basis.
5.2	Rig wise 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.
5.3	Common mandatory spares to be quoted for each of the equipment for 5 rigs and detailed break-up of item wise quantity & rates to be furnished along with the price bid.
5.4	3 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)
5.5	Three (03) 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)
5.6	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).
5.7	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
5.8	Un-priced list of Rig wise mandatory spares, Common mandatory spares, 3 years operation spares & Commissioning spares to be submitted with Technical offer (Part-2 bid).
5.9	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 for 5 rigs” = “Total landed material cost at BHEL Hyderabad” of T1 in Indian Rupees + “Total Service Charges to BHEL” of T2 in Indian rupees + “Documentation charges for Mast & Substructure & Centralised HPU” of (T3) in Indian Rupees+ Total 4 yrs AMC charges (T4) in Indian Rupees Above is BHEL standard procedure for comparison of price bids.



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SECTION – 6

INTRIGRITY PACT FORMAT



Tender specifications for Pre-bid Tie-up for AC VFD Onshore Rig Equipment

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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.

SI	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):

SI	Name	Phone & Email
1	Shri B. Krishnan AGM/BHEL	Ph: +910423183414 Mo.:+919490492122 krishbadur_h@bhel.in
2	Shri Rajeev Kumar DGM/BHEL	Ph: +910423185290 Mo.:+919490746965 raj31@bhel.in



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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

_____. 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 Independent External Monitor(s), 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:



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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. He commits himself to observe the following principles during his 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 will 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 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 from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to



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demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

Section 5 - Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 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.

Section 6 - Equal treatment of all Bidders/ Contractors / Sub-contractors

- 6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain responsible for any default by his sub-contractors.
- 6.2 The Principal will disqualify from the tender process all bidders who do not sign this 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 Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
- 8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non- disclosure agreement.
- 8.4 The Principal will provide to the Monitor 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 Monitor the option to participate in such meetings.



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- 8.5 The role of IEMs is advisory, would not be legally binding and it is restricted to resolving issues raised by an intending 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, the matter should be examined by the full panel of IEMs jointly as far as possible, 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 CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal/ administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.9 IEM 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 organization should be looked into by the CVO of the concerned organisation.
- 8.10 If the Monitor has 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 Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.
- 8.12 The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

- 9.1 This Pact shall be operative from the date IP 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. Issues like warranty / guarantee etc. should be outside the purview of IEMs.
- 9.2 If any claim is made/ lodged during currency of IP, 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 agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.



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- 10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- 10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- 10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

For & On behalf of the Principal

(Office Seal)

Place-----

Date-----

Witness:_____

(Name & Address) _____

For & On behalf of the Bidder/

Contractor

(Office Seal)

Witness:_____

(Name & Address) _____



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SECTION – 7

PERFORMANCE BANK GUARANTEE FORMAT



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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.....dated³ valued at Rs.....⁴ (Rupees - -----)/FC.....(in words.....) for⁵ (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



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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 thebank 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.



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Unless a demand or claim under this guarantee is made on us in writing on or before the⁷we 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 to⁹

c) Unless the Bank is served a written claim or demand on or before¹⁰

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.



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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



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SECTION – 8

NON DISCLOSURE AGREEMENT



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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 confidentiality 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



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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 decides 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)



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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.



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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

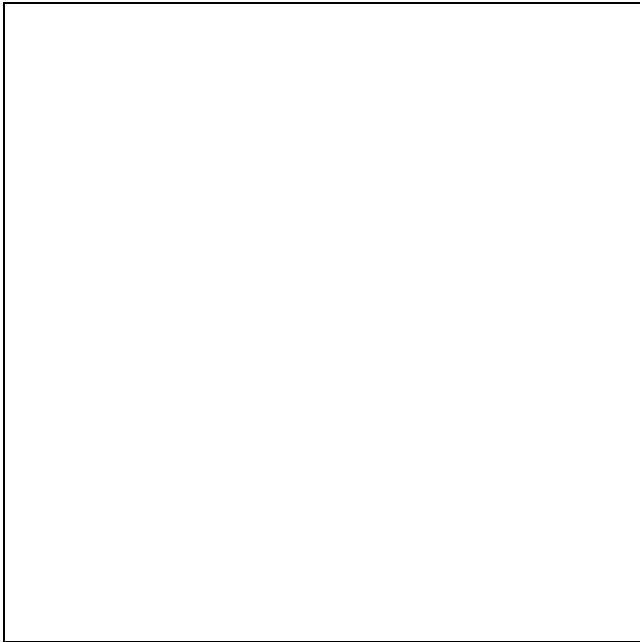
PROJECT

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



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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) _____.



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APPENDIX 3.8A

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

0

SRL NO	CORRESPONDING TENDER SECTION/ CLAUSE	DESCRIPTION OF MANDATORY SPARE	PART NO OF THE SPARE	MANDATORY SPARES					
				UNIT PRICE	QUANTITY OFFERED FOR EACH RIG	UOM	TOTAL VALUE FOR ONE RIG	NO. OF RIGS	TOTAL VALUE FOR FIVE RIGS
Grand Total Z1 for 5 rigs									

*Add extra rows as required



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APPENDIX: 3.8B

COST OF MANDATORY SPARES (COMMON FOR FIVE RIGS)

NOTE: BIDDER SHOULD INDICATE LIST OF ALL THE MANDATORY SPARES. THE LIST OF MANDATORY SPARES SHOULD BE EXHAUSTIVE

TOTAL COST OF MANDATORY COMMON SPARES (TO BE CONSIDERED FOR EVALUATION) 0

SRL NO	CORRESPONDING TENDER SECTION/ CLAUSE	DESCRIPTION OF MANDATORY SPARE	PART NO OF THE SPARE	MANDATORY SPARES			
				UNIT PRICE	QUANTITY REQUIRED AS PER TENDER TERMS or BIDDER'S OFFER	UOM	TOTAL VALUE (COMMON FOR FIVE RIGS)
1							
2							
3							
4							
5							
Grand Total Z2 of Common mandatory spares for 5 rigs							

*Add extra rows as required



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APPENDIX: 3.8C

TOTAL COST OF 3 YEARS OPERATIONAL SPARES FOR FIVE RIGS (NOT TO BE CONSIDERED FOR EVALUATION)							
SRL NO	CORRESPONDING TENDER SECTION/ CLAUSE (IF ANY)	DESCRIPTION OF OPERATIONAL SPARE	PART NO OF THE SPARE	3 YEARS OPERATIONAL SPARES FOR EACH RIG (NOT TO BE CONSIDERED FOR EVALUATION) (TO REMAIN VALID FOR 3YEARS FROM THE DATE OF COMMISSIONING OF THE FIRST TWO RIGS - 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 Z3 of 3 Years Operational for 5 Rigs							0

*Add extra rows as required



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APPENDIX: 3.8D

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 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
18							0
Grand Total Z4 of Commissioning spares of equipment's for 5 rigs							

*Add extra rows as required



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APPENDIX: 3.9

TOTAL COST OF 3 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	3 YEARS OPERATIONAL SPARES FOR AMC EQUIPMENT EACH RIG (NOT TO BE CONSIDERED FOR EVALUATION) (TO REMAIN VALID FOR 3YEARS FROM THE DATE OF COMMISSIONING OF THE FIRST TWO RIGS - 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 Z5 of 3 Years Operational Spares for AMC EQUIPMENT for 5 Rigs							0

*Add extra rows as required