CORRIGENDUM

1.0 Amendment No. 2 dated 14.02.2017 to Tender o. SJG3234P17 has been issued to amend the tender specification post pre-bid conference and also to extend the Bid Closing/Opening Date as well as Tender Sale Date against Tender No. SJG3234P17 as under :

Bid Closing Date & Time	:	28.02.2017 at 11-00 hrs. (IST)
Tech. Bid Opening Date & Time	:	28.02.2017 at 15-00 hrs. (IST)
Last Date of Tender Sale	:	21.02.2017

2.0 Bidders are to be guided as per the Revised Tender Document as under and pre-bid query reply uploaded in the e-portal and submit their bid accordingly.

REVISED TENDER DOCUMENT

Tender No. & Date : SJG3234P17 Dated 08.12.2016

Tender Fee : INR 6,000/- OR USD 100/-

Bid Security Amount : INR 1,15,000/- OR USD 1,665/-

Bid Validity : Bid should be valid for 120 days from bid closing date.

Bid Bond Validity : Bid Bond should be valid upto 07.08.2017

(Bid bond format has been changed. Please submit bid bond as per revised format failing which offer will be rejected)

Bidding Type : SINGLE STAGE TWO BID SYSTEM

Bid Closing on : As mentioned in e-portal

Technical Bid Opening on : As mentioned in e-portal

Performance Guarantee : Applicable @ 10% of purchase order value.

Note: Against Tender Fee - Payment should be made only through online payment gateway and no other instrument (Cash/DD/Chequ'es/Cashier Cheque, etc.) will be acceptable.

Against Bid Security /EMD /Performance Bank Guarantee – Only payments through online gateway mode or Submission of Bank Guarantee/LC will be acceptable. No DD/Cheques/Cashier Cheque or any other mode will be acceptable.

OIL INDIA LIMITED invites Global Tenders for items detailed below:

Item No./Mat. Code	Material Description	QTY.	UOM
10 0C000570	PROGRESSIVE CAVITY PUMPS WITH ACCESSORIES	2	NO
20	INSTALLATION & COMMISSIONING	2	AU

The tender will be governed by:

a) Instructions to Bidders - Annexure – I

a) Scope of work/terms of reference/technical specifications
Special Terms and Conditions
Bid Evaluation Criteria (BEC) /Bid Rejection Criteria (BRC) – Annexure - II.

c) Integrity Pact- Proforma-III

d) Material Specification PCPEMDL under Appendix A, B & C

e) General Terms & Conditions" for e-Procurement as per Booklet No. MM/RP/GLOBAL/E-01/2005, user manual and general guideline for e-procurement.

Pre-Bid Conference: A pre-bid conference to explain Company's exact requirements and to reply queries of Bidders, if any, on the tender stipulations will be held on 12.01.2017 at 11:00 hrs (IST) in OIL's Project Office at 2A, District Shopping Centre, Saraswati Nagar, Basni, Jodhpur -342005, Rajasthan. Maximum of two representatives of each bidder will be allowed to attend the pre-bid conference on producing authorization letter. Bidders interested to attend the Pre-Bid Conference should intimate Chief Manager (M&C), Oil India Limited , Jodhpur latest by 10.01.2017.

Note: The bidder's queries, if any should reach us at least 4 working days prior to the date of Pre-bid conference.

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ANNEXURE – I

INSTRUCTIONS TO BIDDERS

1.0 All the Items shall be procured from single source for compatibility reasons.

3.0 The items covered by this enquiry shall be used by Oil India Limited in the PEL/ML areas which are issued/renewed after 01/04/99 and hence Nil Customs Duty during import will be applicable. Indigenous bidder shall be eligible for Deemed Export Benefit against this purchase. Details of Deemed Export are furnished vide Addendum to MM/RP/GLOBAL/E-01/2005 attached. However, Indian bidders will not be issued Recommendatory Letter.

4.0 Please note that all tender forms and supporting documents are to be submitted through OIL's e-Procurement site only except following documents which are to be submitted manually in sealed envelope super scribed with **Tender no.** and **Due date** to **The Chief Manager (M&C), Materials & Contracts Department, Oil India Limited, Rajasthan Project, 2A-Saraswati Nagar, Basni, Jodhpur - 342005, Rajasthan** on or before **11:00 Hrs (IST)** on the Bid Closing Date mentioned in the Tender.

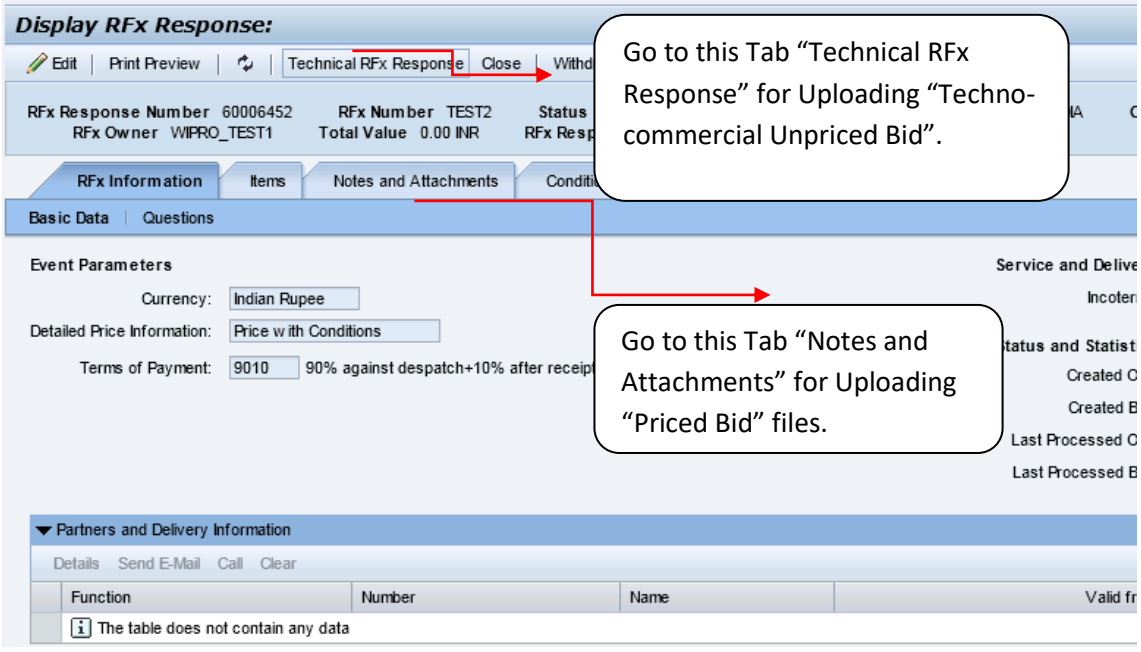
a) **Original Bid Security .**
b) **Details Catalogue and any other document which have been specified to be submitted in original.**

All documents submitted in physical form should be signed on all pages by the authorised signatory of the bidder and to be submitted in triplicate.

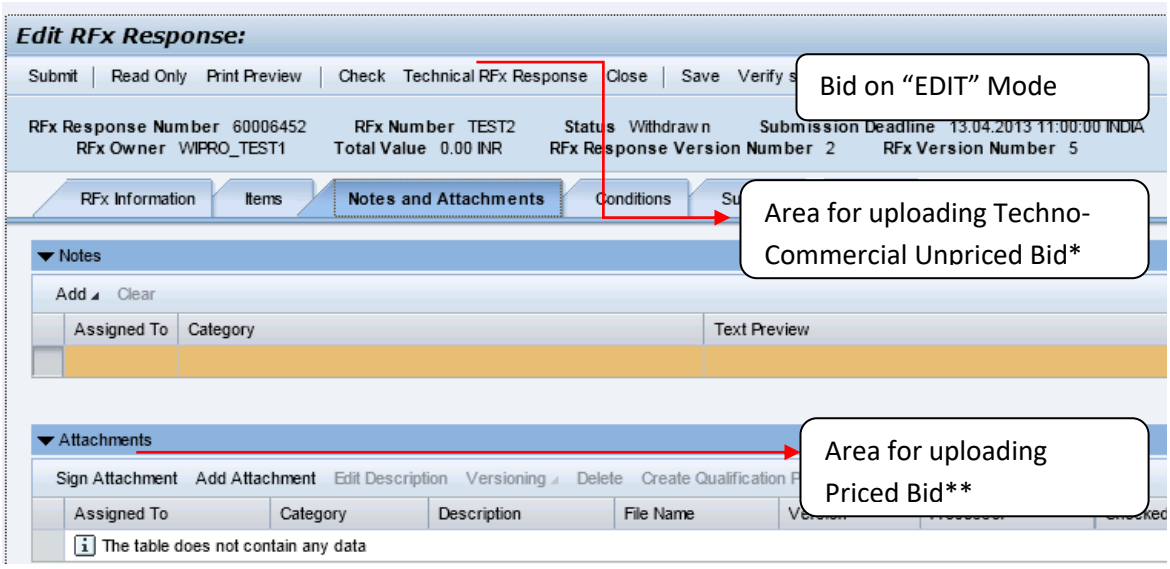
5.0 In case of SINGLE STAGE-TWO BID SYSTEM, bidders shall prepare the "Techno-commercial Unpriced Bid" and "Priced Bid" separately and shall upload through electronic form in the OIL's e-Tender portal within the Bid Closing Date and Time stipulated in the e-Tender. The "Techno-commercial Unpriced Bid" shall contain all technical and commercial details except the prices which shall be kept blank. Details of prices as per Price Bid Format / Commercial Bid to be uploaded as attachment in the Attachment Tab "Notes and Attachments".

A screen shot in this regard is given below.

Any offer not complying with above submission procedure will be rejected as per Bid Evaluation Criteria mentioned in the tender.



On "EDIT" Mode- The following screen will appear. Bidders are advised to Upload "Techno-Commercial Unpriced Bid" and "Priced Bid" in the places as indicated above:



Note :

* The "Techno-Commercial Unpriced Bid" shall contain all techno-commercial details **except the prices**.

** The "Price bid" must contain the price schedule and the bidder's commercial terms and conditions. For uploading Price Bid, first click on Sign Attachment, a browser window will open, select the file from the PC and click on Sign to sign the Sign. On Signing a new file with extension.SSIG will be created. Close that window. Next click on Add Atachment, a browser window will open, select the .SSIG signed file from the PC and name the file under Description, Assigned to General Data and clock on OK to save the File.

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

7.0 Other terms and conditions of the tender shall be as per "General Terms & Conditions" for e- Procurement as per Booklet No. MM/RP/GLOBAL/E-01/2005 for E-procurement (ICB Tenders) and its amendments. However, if any of the Clauses of the Bid Evaluation Criteria (BEC) / Bid Rejection Criteria (BRC) mentioned here contradict the Clauses in the "General Terms & Conditions" for e-Procurement as per Booklet No. MM/RP/GLOBAL/E-01/2005 for E-procurement (ICB Tenders) of the tender and/or elsewhere, those mentioned in this BEC/BRC shall prevail.

8.0 The Integrity Pact is applicable against this tender .OIL shall be entering into an Integrity Pact with the bidders as per format enclosed vide Proforma-III of the tender document. This Integrity Pact proforma has been duly signed digitally by OIL's competent signatory. The proforma has to be returned by the bidder (along with the technical bid) duly signed (digitally) by the same signatory who signed the bid, i.e., who is duly authorized to sign the bid. Uploading the Integrity Pact with digital signature will be construed that all pages of the Integrity Pact has been signed by

the bidder's authorized signatory who sign the Bid. **If any bidder refuses to sign Integrity Pact or declines to submit Integrity Pact with the offer, their bid shall be rejected straightway.**
OIL's Independent External Monitors at present are as under:

1. **SHRI RAJIV MATHUR, IPS(Retd.),**
   e-Mail ID : rajivmathur23@gmail.com

2. **SHRI SATYANANDA MISHRA, IAS(Retd.)**

   Former Chief Information Commissioner of India & Ex-Secretary, DOPT, Govt. of India
   e-Mail ID : satyanandamishra@hotmail.com

9.0 GUIDELINES FOR PARTICIPATING IN OIL'S E-PROCUREMENT:

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

9.2 Bidders must have a valid User ID to access OIL e-Procurement site for submission of bid. Vendors having User ID & password can purchase bid documents **on-line through OIL's electronic Payment Gateway**. New vendor shall obtain User ID & password through online vendor registration system in e-portal and can purchase bid documents subsequently in the similar manner. Tender Fee (Non-refundable) of INR 6,000.00 OR USD 100.00 Payment should be made only through online payment gateway and no other instrument (Cash/DD/Chequ'es/Cashier Cheque, etc.) will be acceptable.Tender fee shall be accepted only upto one week prior to Bid Closing date (as mentioned in e-portal).

For participating in Oil India limited e-tenders, all new vendors must get themselves enlisted in Oil India e-portal. Please go to the url: https://etender.srm.oilindia.in/irj/portal and go to the link Supplier Enlistment for E-Tender. For, the detailed procedure for payments towards 'Tender Fee' and 'Bid Security /EMD' through 'Payment Gateway', please refer the manual.

No physical tender documents will be provided. Details of NIT can be viewed using "Guest Login" provided in the e-Procurement portal. The link to e-Procurement portal has also been provided through OIL's web site www.oil-india.com.

PSUs and SSI units are provided USER_ID and initial PASSWORD Free of Cost (as per govt guidelines), however they have to obtain USER_ID and initial PASSWORD as mentioned above and apply to OIL's designated office before the last date of receipt of tender fee (as mentioned in e-portal).

9.3 Parties shall be eligible for accessing the tender in E-portal after OIL enables them in the E-portal after receipt of the requisite cost of the bidding document.

10.0 Any sum of money due and payable to the Bidder (including Security Deposit refundable to them) under this or any other contract may be appropriated by Oil India Limited and set-off against any claim of Oil India Limited (or such other person or persons contracting through Oil India Limited) for payment of sum of money arising out of this contract or under any other contract made

by the Bidder with Oil India Limited (or such other person or persons contracting through Oil India Limited.

11.0All corrigenda, addenda, amendments, time extension, clarifications etc. To the tender will be hoisted on OIL's website (www.oil-india.com) and in the e-portal (https://etenders.srm.oilindia.in/irj/portal) only and no separate notification shall be issued in the press. Prospective bidders are requested to regularly visit the website and e-portal to keep themselves updated.

12.0 Bidder shall accept and comply with the following clauses as given in the Bid Document, failing which bid shall be liable for rejection:

i) Firm Price
ii) Bid Security
iii) Specifications / Scope of Work
iv) Price Schedule
v) Delivery Schedule
vi) Period of Bid Validity
vii) Liquidated Damages
viii) Performance Security
ix) Guarantee of material
x) Arbitration / Resolution of Dispute
xi) Force Majeure
xii) Applicable Laws
xiii) Integrity Pact

13.0 A bid shall be rejected straightway if it does not conform to any one of the following clauses:
(a) Validity of bid shorter than the validity indicated in the Tender.
(b) Original Bid Security not received within the stipulated date & time mentioned in the Tender.
(c) Bid Security with (i) validity shorter than the validity indicated in Tender and/or Bid Security amount lesser than the amount indicated in the Tender.
(d) In case the Party refuses to sign Integrity Pact.

14.0 PURCHASE PREFERENCE : Purchase Preference will be applicable as per latest Govt. Guidelines. Bidders to take note of the same and quote accordingly. It is the bidder's responsibility to submit necessary documents from the Competent Authority to establish that they are eligible for purchase preference against this tender.

15.0 PRICE PREFERENCE : Price Preference will be applicable as per latest Govt. Guidelines. Bidders to take note of the same and quote accordingly. It is the bidder's responsibility to submit necessary documents from the Competent Authority to establish that they are eligible for price preference against this tender.

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ANNEXURE – II

SECTION-I

SCOPE OF WORK/TERMS OF REFERENCE/TECHNICAL SPECIFICATIONS

INTRODUCTION

OIL INDIA LIMITED (OIL), a premier National Oil Company, is engaged in the business of exploration, production and transportation of crude oil and natural gas for over five decades. It is a Navratna Company under Ministry of Petroleum and Natural Gas, Government of India and the second largest National Oil Company in the country.

Rajasthan Project, one of the projects of OIL, is engaged in exploration and production of Natural Gas from Jaisalmer Basin and exploration of Heavy oil in Bikaner-Nagaur basin within Jodhpur Sandstone of Infracambrian age of Western Rajasthan in India. OIL intends to exploit heavy oil from Baghewala structures with state of the art technology. This document addresses the requirement of equipment & services from a reputed Bidder having adequate knowledge base and past experience in the field of Heavy Oil production.

DEFINITIONS:

COMPANY	Oil India Limited
BIDDER	Organization that supplies the equipment and provides the service according to the Functional Specification.
COUNTRY OF OPERATION	India.
OPERATING AREA	Means the onshore area defined as Baghewala.
MINING LEASE	A legal contract for the right to work in a mine and extract the mineral or other valuable deposits from it under prescribed conditions of time, price, rental, or royalties
NELP	New Exploration Licensing Policy, conceptualized by the Government of India, during 1997-98 to provide an equal platform to both Public and Private sector companies in exploration and production of hydrocarbons with Directorate General of Hydrocarbons (DGH) as a nodal agency for its implementation.
OPERATING ENVIRONMENT	Operating environment is the set of conditions, which the SYSTEM / SERVICE PACKAGE is exposed to during its full life cycle.
FUNCTIONAL SPECIFICATION	Features, characteristics, process conditions, boundaries and exclusions defining the performance of a product or service, including the quality assurance requirements.

SYSTEM PACKAGE	The equipment and the related services identified under the term Electrical Down Hole Heater at the head of the functional specification document and as listed under 'Appendix A, B & C of the same document.
FULL LIFE CYCLE	The period of time in which the device is fully functional in the well, including its installation and retrieval.
STANDARD OPEARTING PROCEDURE	Step-by-step written procedure that guides personnel to perform an activity safely in a consistent manner.
SCOPE	State scope of document as intention, i.e. what the document intended to achieve.
SHALL	Is used to indicate requirements that MUST be satisfied in order to comply with the Scope of Work.
SHOULD	Is used to indicate requirements that are preferred. BIDDER proposes alternatives shall clearly identify as such and shall be supported with objective evidence.
MAY	Is used to indicate that a provision is OPTIONAL.

ABBREVIATED TERMS:

Term	**Definition**
ML	Mining Lease
NELP	New Exploration Licensing Policy
LOA	Letter of Award
LOT	Leak off Test
DST	Drilling Stem Testing
BGW	Baghewala
NW	North West
ENE	East North East
WSW	West South West
BHA	Bottom Hole Assembly
ASTM	American Society for Testing and Materials
API	American Petroleum Institute
bbls	Barrels
BHP	Bottom Hole Pressure
BHT	Bottom Hole Temperature
BOD	Basis of Design
PEP	Project Execution Plan
SOP	Standard Operating Procedure
cp	Centipoise

Term	Definition
Deg F	Degree Fahrenheit
IEEE	Institute of Electrical and Electronics Engineers
ISO	International Organization for Standardization
ALARP	As Low As Reasonably Practicable
NACE	National Association of Corrosion Engineers
NEMA	National Electrical Manufacturers Association
PCP	Progressive Cavity Pump
OD	Outside Diameter
ID	Inside Diameter

SCOPE

Scope of this document is to provide COMPANY's minimum functional specification requirement of Progressive cavity pump and accessories, monitoring equipment Variable Speed Drive and Electric motor to the BIDDER.

The scope of supply is broadly divided into 2 (two) modules:

- **Module 1:** Equipment design, manufacturing and supply
- **Module 2:** Equipment preparation, installation, commissioning and start-up;

APPLICABLE DOCUMENTS

CONSULTANT should follow the industry recognized standards, specifications, codes, regulations and recommended practices listed in the following table. CONSULTANT shall comply with the latest edition of the listed documents unless otherwise stated.

RECOMMENDED PRACTICES AND INTERNATIONAL STANDARD

Reference (API Standard)	Description
API Spec 5CT	Specification For Casing and Tubing
API Spec 5D	Specification For Drill Pipe
API Spec 4F	Specification For Drilling and Well Servicing Structures
API Bull 5C2	Bulletin On Performance Properties of Casing, Tubing and Drill Pipe
API Spec 7	Specification For Rotary Drilling Equipment
API Spec 8	Specification For Drilling and Production Hoisting Equipment
API Spec 6A	Specifications for valves and wellhead equipment
API Spec 5L	Specification For Line Pipe
Reference (API)	**Description**

API Spec 5 B	Specification for Threading Gauging
API Bull 5A2	Bulletin On Thread Compounds For Casing, Tubing and Line Pipe
API Spec 13	Specification For Oil Well Drilling Fluid Materials
API Q1	Specification for Quality Program
API Spec 11D2 &D3	Design, design validation, manufacturing and data control, performance ratings, functional evaluation, repair, handling and storage of Progressive cavity pump.
API 11 B	Rod type, Grade and Chemical Properties, Mechanical Properties and Heat Treatment of Sucker Rods and Pony Rods
API Spec RP 17B	Recommended practice for flexible pipes
API 505	Recommended Practice For Classification of Locations For Electrical Installations at Petroleum Facilities Classified as Class 1, Zone 0, Zone 1 and Zone 2

Reference (API-RP)	**Description**
API RP 5A&D3	Recommended Practice For Field Inspection of New Casing, Tubing and Plain End Drill Pipe cavity pump.
API RP 5C/C1	Recommended Practice For Care and Use of Casing and Tubing
API RP 11S5/API RP 11 S6	TEC line Cable
API RP 13F	Bulletin On Oil Gas Well Drilling Fluid Chemicals
API RP 54	Recommended Practices For Safety and Health For Oil and Gas Well Drilling and
API RP 59	Recommended Practices For Well Control Operations
API RP 44	Recommended practice for sampling petroleum reservoir fluids
API RP 520	Recommended practice for sizing, selection and installation of pressure relieving devices.
API RP 521	Recommended practice for pressure relieving and depressurizing systems

Reference (ASTM)	**ASTM Specifications**
ASTM A370	Standard Method and Definitions for Mechanical Testing of Steel
ASTM E18	Standard Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of
ASTM E317	Practice for Evaluating Performance Characteristics of Ultrasonic Pulse-Echo Testing
ASTM E428	Standard Practice for Fabrication and Control of Metal, Other than Aluminum Reference, Blocks used in Ultrasonic Examination
ASTM D1418	Standard Practice for Rubber and Rubber Lattices
ASTM A 751	Methods, Practices and Definitions fo Chemical Analysis of Steel
ASTM D 395	Test Methods for Rubber Property- Compression Set
ASTM D 471	Standard Test Method for Rubber Property – Effect of Liquids

ASTM D 412	Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers.
ASTM D 2240	Test Methods for Rubber Property- Durometer Hardness

Reference (NACE)	**Description**
NACE TM-01-77	Laboratory Testing of Metals for Resistance to Specific Forms of Environmental
NACE MR-01-75	Sulphide Stress Cracking Resistance Metallic Material for Oilfield

Reference (IS)	**Description**
ISO 14310	Petroleum and gas Industries – Down hole Equipment – Packers and bridge plugs
ISO 11960	Specification for Casing & Tubing
ISO TS29001	Petroleum, petrochemical and natural gas industries Sector-specific, Quality Management systems Requirements for product and service supply organizations
ISO 15156 part 1,2 and 3	Petroleum and natural gas industries - Materials for use in H2S-containing environments in oil and gas production
ISO 15136 Part 1	Petroleum and natural gas industries – Progressive Cavity Pumps Systems for Artificial Lift – Part 1: Pumps
ISO 15136-2 Part 2	Petroleum and natural gas industries – Progressive Cavity Pumps Systems for Artificial Lift – Part 2: Surface Drive Systems

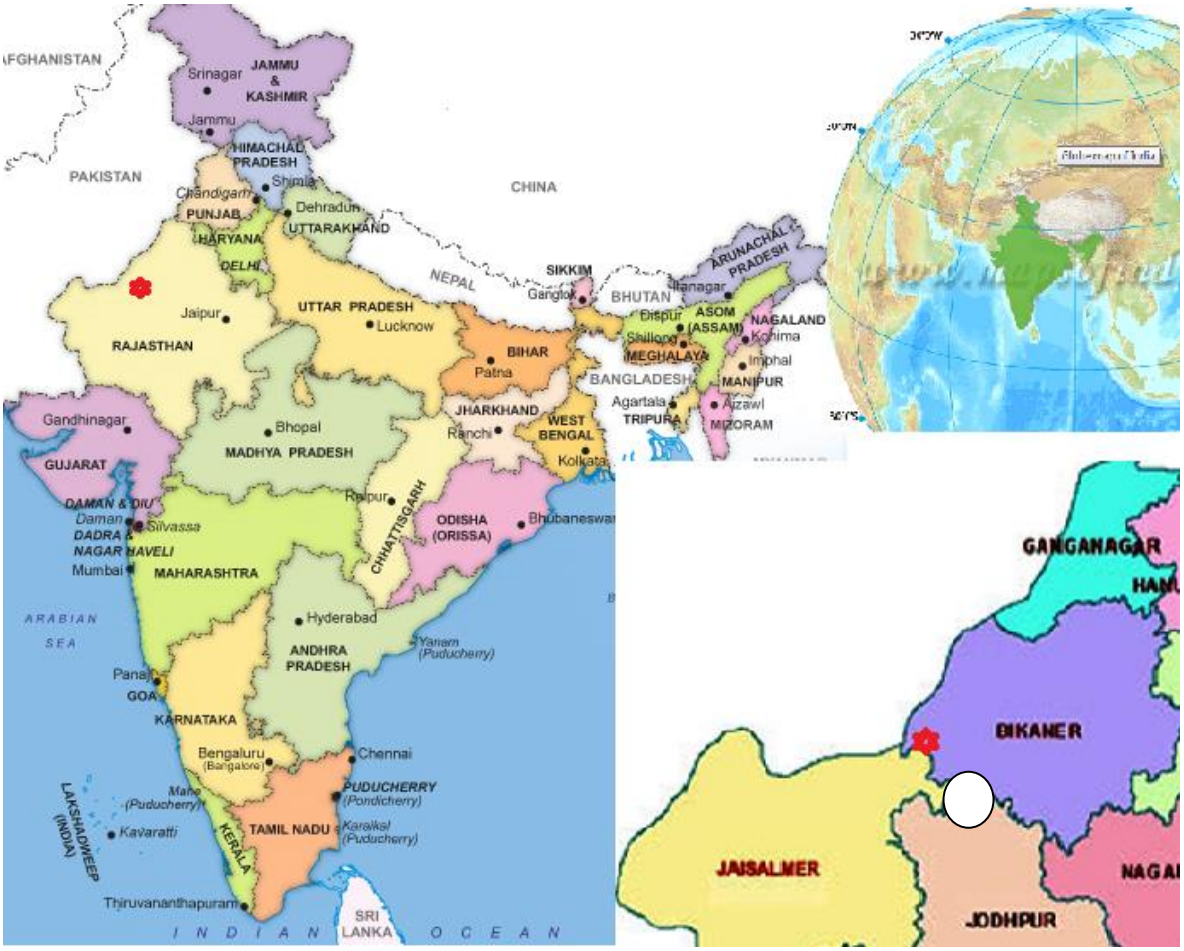
NOTE: the above list is not intended as being fully exhaustive and as such the COSULTANT shall comply with any other applicable Specifications, Standards or Codes in consultation with COMPANY.

OPERATING AREA

GEOGRAPHIC LOCATION

BAGHEWALA, THE AREA OF OPERATION, IS LOCATED AT THE WESTERN PART OF THE COUNTRY INDIA AND IN THE STATES OF RAJASTHAN. RAJASTHAN ENCOMPASSES MOST OF THE AREA OF GREAT INDIAN DESERT (THAR DESERT), WHICH HAS AN EDGE PARALLELING THE SUTLEJ-INDUS RIVER VALLEY ALONG ITS BORDER WITH PAKISTAN. THE REGION BORDERS PAKISTAN TO THE WEST, GUJARAT TO THE SOUTHWEST, MADHYA PRADESH TO THE SOUTHEAST, UTTAR PRADESH AND HARYANA TO THE NORTHEAST AND PUNJAB TO THE NORTH.

The nearest airport to the operating area is Jodhpur Airport and is located at a distance of around 350 km.



ENVIRONMRNTAL CONDITIONS

Components	International System (SI)
Ambient Temperature (Max. / Min.)	**50 / -1 Deg C**
Humidity (Max.)	**40-60%**
Average Rainfall	**25 mm/year**
Wind velocity (Max.)	**128 KM/Hr**
Frequecy of Sand strom	**March to September and occasional during the remaining period.**
Seismic	**Zone III, Moderate**
Weather	**Four distinct seasons - Pre monsoon, monsoon, post-monsoon and Winter**
Topography of Site	**Part of Thar Desert**

LOCATION OF THE STUDY AREA:

The coordinate of the study area are as under:

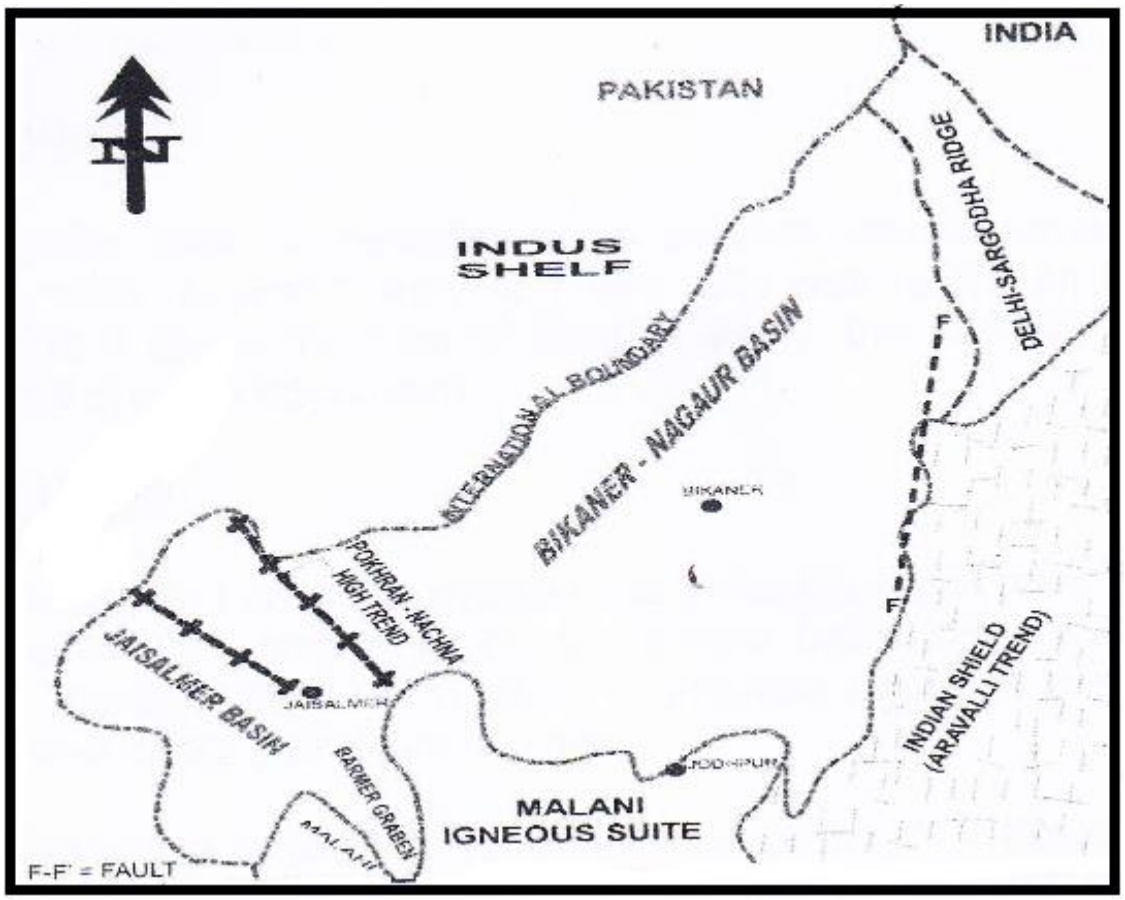
Pt.	Coordinates					
	Latitude(N)			Longitude(E)		
	degree	minute	second	degree	minute	second
BAGHEWALA PML						
A	**27**	**43**	**41**	**71**	**57**	**33**
B	**27**	**48**	**08**	**71**	**52**	**49**

C	**27**	**52**	**08**	**71**	**58**	**24**
D	**27**	**52**	**28**	**72**	**09**	**48**
NELP-VI Block						
a	**27**	**55**	**00**	**72**	**00**	**18.27**
b	**27**	**55**	**20.76**	**72**	**12**	**04**
c	**27**	**46**	**46**	**72**	**12**	**37**
d	**27**	**46**	**25.56**	**72**	**07**	**51.36**
e	**27**	**49**	**00**	**72**	**04**	**59.62**
D	**27**	**52**	**28**	**72**	**09**	**48**
f	**27**	**52**	**90.6**	**72**	**00**	**29**

REGIONAL STRATIGRAPHIC

REGIONAL GEOLOGY

Baghewala Mining Lease (ML) is located in the Bikaner-Nagaur basin of west Rajsthan. The Bikaner-Nagaur basin constitutes a Late Proterozoic-Early Paleozoic basin in the north western part of peninsular Indian shield. Structurally, Bikaner-Nagaur basin is bounded by the Aravalli ranges to the southeast, Delhi-Sargoda ridge to the northeast, and the pokhran-Nachna High to the southwest which separates it from Jaisalmer basin. To the northwest, the Bikaner-Nagaur basin extends to the Salt Range of the Upper Indus basin of Pakistan.



Tectonic Map of Bikaner Nagaur Basin

The Bikaner-Nagaur Basin of northwest Rajasthan is the remnant of a continental rim basin with sediments deposited in an epiric sea. The continental rim basin was developed on the margin of Gondwanaland during the late Neoproterozoic through Permian time. The generally accepted plate tectonic reconstruction for the end of Neoproterozoic time shows the relationship of the Arabian Salt basins with the Indian salt basin (Allen, 2007). The Bikaner-Nachna basin is bounded on the south-southeast by outcrops of the constituent formations. The western boundary is the Jaisalmer-Sulaiman basins that form the northward extension of the West India Rift-basin trend. The north and eastern margins are formed by the Salt Range thrust belt and the Lahore-Delhi arch. Only the outcrop belt has any resemblance to the edges of the original basin.

The Pokhran- Nachna Arch is a basement high initiating from the outcrop of the Jalor Granite member of the Malani Group southwest of the town of Pokhran (Roy, 2001), plunges northward west of Nachna and through the area of the Baghewala ML. This structural high originated in the Neoproterozoic, and it has been reactivated several times through geologic history.

At Baghewala ML, the Pokhran-Nachna Arch is expressed as a structural high where the Jodhpur Sandstone is absent or present as a thin layer over the crests of local highs. Seismic data near these wells show dipping beds of the Malani Rhyolite in nonconformity with a dacite intrusive body.

STRUCTURE:

The Baghewala anticline is interpreted as a ramp anticline formed by the offset of a fault in the basement. Seismic data also suggest that a younger phase of deformation was super imposed. It is characterized by normal faulting which is considered to be Jurassic-Cretaceous or younger in age. Seismic lines and cross sections show that the post-Jurassic sedimentary sequences become thicker and deeper towards the Himalayan Mountain Front. They also show that the folded post-Infra cambrian sequences are eroded on the crest of the structures by the Permian unconformity.

STRATIGRAPHIC SUCCESSION

The Stratigraphic Sucession of Bikaner Nagaur basin as under:

AGE			FORMATION	THICKNESS(m)	LITHOLOGY
QUARTERNARY	RECENT		Alluvium / Shumar	70-95	Fine to Medium Grained Sand
	PLEISTOCENE				
TERTIARY	EOCENE		Palana and Marh	20 - 110	Clayey limestone and dark grey claystone
	PALEOCENE				
MESOZOIC	CRETACEOUS		Parh Equivalent	30 - 35	Dark grey claystone and sandstone
	JURASSIC		Jaisalmer + Lathi	290 - 380	Red claystone and ferruginous sandstone with minor coal
	TRIASSIC				
	PERMIAN		Bap and Badhaura	58 - 70	Red yellow and grey claystone and silts with conglomerate
PALEOZOIC	MARWAR SUPERGROUP	INFRA CAMBRIAN	Upper Carbonate	250 - 600	Laminated dolostone and limestone with red claystone interbeds and occasional marl
			Nagaur	150 - 300	Mottled claystone with siltstone, fine grained sandstone and minor dolostone
			Hanseran Evaporite Group	140 - 150	Anhydrite, Halite, claystone and dolostone
			Bilara	50 - 120	Dolostone, fine grained sandstone & reddish brown claystone
			Jodhpur	25 - 30	Coarse to fine grained, well sorted sandstone (pinkish), with siltstone and claystone
PROTEROZOIC	PRE-CAMBRIAN		Malani Suits	120 - 350	Volcanoclastics with basalt and Rhyolitic flows
			Crystalline Basement	--	Granitoid Rocks

HYDROCARBON PROSPECT:

WELL EVIDENCE

A total of 6(Six) wells have been drilled in the Baghewala ML area. The outcome of Drilling of these wells are outlined as under:

The presence of heavy oil in Baghewala structure has been established during 1991 through drilling of the first exploratory well BGW-1 in the structure. The well BGW-1, drilled down to the basement (TD – 1375 m), encountered heavy oil (17 – 19 Deg API) in the deeper Infracambrian formations viz., Jodhpur and Bilara.

The well BGW-2 was drilled at the same plinth of BGW-1 in order to test the Upper Carbonate. The well BGW-2, drilled down to 675m within the Upper Carbonate formation, conventional production testing of the Upper Carbonate through perforations showed water only.

To assess the northward extent of heavy oil within Jodhpur Sandstone, BGW-3 was drilled at a distance of about 1.3 km NW of well BGW-1 as an appraisal well. Well BGW-3 was drilled down to a final depth of 1350 m within Malani Volcanics. Initial production testing was carried out in this well in Jodhpur sandstone. On testing, through DST, the well showed inflow of only formation water with traces of asphaltic materials.

The fourth well, BGW-4, is located at a distance of about 2.4 km towards ENE from well BGW-1. This well was drilled as the second appraisal well of Baghewala structure and drilled down to 1152 m within Malani Volcanics. On conventional production testing of 1090 m Jodhpur Sand, the presence of high viscous heavy oil was established.

The well BGW-5 is located at a distance of about 2.6 km towards WSW from BGW-1. This is the third appraisal well drilled in Baghewala structure. The well was drilled down to a depth of 1252m within Malani Volcanics. On conventional production testing of 1181 m Jodhpur Sand, the presence of high viscous heavy oil was established.

The well BGW-6 was drilled as Pilot well for recovery of Bitumen from Upper Carbonate Formation using Steam Injection technology on experimental basis. The well was drilled down to a final depth of 857m and completed for cyclic steam injection. However, during injection of steam attempted twice in 2006 and 2007, operational problem related to elongation of casing with well head and leakage of steam were encountered and the project had to be suspended.

8.1.7 Two wells Punam-1 and Tavriwala-2 was drilled in two different structures (East of Baghewala Structure) in 2012 and encountered heavy oil in Jodhpur formation. The well Punam-1 was drilled in NELP area, is located around 15 km towards NE from BGW-1 and major part of the structure falls in Baghewala PML area. Tavriwala-2 was drilled in Tavriwala structure located around 10 km towards west from BGW-1.

PRODUCTION EFFORT

Experimental Production Testing of BGW-1 and BGW-4 was carried out in the year 1995 with Progressive Cavity Pump and Bottom Hole Heater Completion and achieved a maximum production rate of 3-4 KLPD (18-25 BOPD).

In the year 2009-10, another Experimental Cold Production of Heavy Oil was carried out with Chemical Stimulation and Sucker Rod Pump Artificial lift assistance in BGW-1 and BGW-4. An intermittent production rate of 4.5-5.5 KLPD (25-30 BOPD) was achieved.

In the year 2012, production testing was carried out in Punam-1 with Chemical Stimulation and Sucker Rod Pump Artificial lift assistance and an intermittent production rate of 1.4 KLPD (7.7 BOPD) was achieved.

RESERVOIR/ROCK MATRIX/PETROPHYSICAL CHARACTERISTICS:

Description	Parameters	Value
Reservoir Parameters	Reservoir Depth	1050 – 1300 m
	Pay Thickness	5 – 23 m
	Bottom Hole Pressure	1600 psi @ 1100m at BGW structure and 1044 psi @ 1190m in neighboring Punam Structure
	Bottom Hole Temperature	50C – 52C
Rock Matrix Characteristics	Porosity	18 – 20%
	Permeabilty	<1000 MD
Petro-physical Characteristics	°API	14 – 18 API
	Pour Point(°C)	21 – 27 deg
	Sp. Gravity	0.9679 – 0.9229
	Viscosity (cp)	Approx 13000 cp at 50 deg C

HSE DESIGN GUIDELINE

The design shall follow a process in which significant risks to Health, Safety and the Environment are identified and assessed in the initial design phase.

Inherent safety, control and recovery measures, necessary to reduce risks to ALARP levels, shall be determined and thereafter incorporated in the design, the measures chosen to achieve ALARP HSE risk levels shall be suitable for implementation during the detailed design phase and capable of being maintained during the operational phase.

Hazards and effects studies shall be carried out during the initial phase to provide early design input information. This approach aims to maximize the opportunities for risk reduction offered by a pro-active HSE consideration in design rather than by retrospective HSE review and subsequent design changes. Adopting this approach will create opportunities to minimize and / or eliminate HSE related cost and schedule impacts.

HSE activities during the design process shall focus on the identification of HSE risks and the hazards and effects that generate them. Risk management shall be by control (threat barriers) and recovery (mitigation and emergency response) measures, to ALARP risk levels.

The design, as well as being pro-active in the use of outputs from hazards and effects studies (HAZIDs and HAZOPs), shall use the application of appropriate engineering experience, judgment and applicable codes and standards to achieve the highest practicable reductions in risks to health, safety and the environment.

0 RESPONSIBILITY

10.1 GENERAL

BIDDER is responsible for the compliance with the requirements set forth in this document. In no way does this specification relieve the BIDDER from his obligation to meet all the relevant Director General of Mines & Safety Standards, India (DGMS), Industry recognized Recommended Practices, practical rules and local authority regulations wherever applicable.

Nothing in this COMPANY's functional specification shall relieve the BIDDER from the responsibility of performing, in addition to the requirements of this specification, such analysis, tests, inspections, and other activities that he considers necessary to ensure that the product, material and workmanship are fully satisfactory for the service intended.

BIDDER shall provide a written warranty for the equipment components and all the related accessories/miscellaneous equipment required to perform the job. Bidder has to conform to the quality requirement of ISO 15136.

Bidder has to provide Progressive Cavity Pump performance curve for the model provided along with the product.

The warranty shall cover a minimum of 18 (EIGHTEEN) months from shipment date or 12 (TWELVE) months from the Equipment commissioning date, whichever is earlier. The warranty shall fully cover COMPANY against any manufacturing, handling, installation and commissioning defects and/or malfunctioning. Defective equipment shall be repaired by BIDDER within maximum 1 (one) month. If the defective equipment can't be repaired, BIDDER shall replace said equipment within maximum 6 (six) months time with a device of the same specifications and free from defects. The replaced equipment shall be covered by a new warranty period of 18 (eighteen) months.

10.2. ELASTOMER COMPOUND COMPATIBILITY TESTING

BIDDER is responsible to carry out the full scale compatibility testing in full compliance with the **ASTM D471, ASTM D4175, ASTM D412, ASTM D2240, ASTM D395, and ASTM 3182** and as indicated in the **ISO 15136** Part 1 standards.

BIDDER shall submit the Compatibility Test Report to COMPANY as soon as available in order to technically support BIDDER proposed Elastomer Compound and Rotor size selection. Bidder also has to submit Elastomer Property sheet along with the equipment.

The Elastomer compound shall be made of 'High-Nitrile' and shall comply with the following minimum requirements:

- Water Resistance at low temperature (< 50 deg. C): Good;
- Water Resistance at elevated temperature (> 50 deg. C): Good;
- H2S, Solids , CO2 and aromatics Resistance: Good;
- Fluid maximum Temperature of 100 deg. C;

The Stator Elastomer Compound shall be compatible and capable to operate when exposed to Condensate (40 °API, Lighter Hydrocarbon) since COMPANY has planned to inject said fluid (20% by volume of the Well flow rate) to dilute the Heavy-Oil from approximately 14 deg. API to 18 deg. API. The main scope of the diluents injection is to lighten the Tubing hydrostatic column to accelerate production and to reduce torque on the Rod String.

The diluents injection point would be at the toe of the liner, below the PCP Intake.

COMPANY shall provide BIDDER the following field representative fluids 'samples':

- Extra Heavy Oil: 4 lit;
- Condensate (Lighter Hydrocarbon of 40^0 API): 2 lit.
- Xylene : 2 lit.

  The same has to be collected by the bidder on placement of order from our end from OIL's office at Jodhpur.

COMPANY's requires BIDDER to perform the following three (3) Stator Elastomer Compound compatibility tests (i.e. Hardness, Swelling, Elongation and Tensile strength):

a) 100% Heavy-Oil;
b) 80% Heavy-Oil and 20% Condensate;
c) 80% Heavy-Oil and 20% Xylene;

The compatibility testing conditions are:

- Temperature: 232 deg. F (100 deg C);
- Pressure (if the autoclave is available): 1,600 psi;
- Water cut: between 0 to 20%;
- Formation Water salinity: > 60,000 ppm NaCl;
- Solution GOR: Negligible;

The bidder has to evaluate the compatibility of fluids with coupons cut from standard elastomer sheets (Practice ASTM D 3182) or, optionally, from SAE Specification AMS 3217/2B (NBR-L) and AMS 3217/3A (CR) sheets. The coupon size for such test has to be decided by the bidder.

0 DEVICE FUNCTIONALITY MINIMUM REQUIREMENTS

LIFE CYCLE

The proposed equipment shall be designed to maximize the PCP MTTF. COMPANY expectation is for an average MTTF of 4+ (four-plus) years, while the minimum MTTF is expected to be not less than 1.5 (one and half) years.

SUB SURFACE EQUIPMENT COMPATIBILITY REQUIREMENTS

All the down hole equipment end connections shall be compatible with the size and weight of the COMPANY's Production Tubing (2.87" 6.5 ppf API EUE), crossover Subs may be use if required. The crossover Subs shall be provided by the BIDDER and be manufactured with the same thread connections specifications, material grade and metallurgy as the COMPANY's Tubing.

METALLIC MATERIAL COMPATIBILITY REQUIREMENTS

The flow wetted metallic materials used for the construction of BIDDER DEVICES shall not be susceptible to erosion, corrosion, chemical or galvanic attack from reservoir and drilling fluids.

NON METALLIC MATERIAL COMPATIBILITY REQUIREMENTS

Any non-metallic materials used for the construction of the down hole and surface equipment shall be compatible with any fluids, gasses, hydraulic fluids to which the device may be exposed during full life cycle. Elastomeric material should be dimensionally tested, hardness tested and visually inspected according to the applicable standards.

DELIVERY CONDITIONS

The Equipment shall be packed in robust boxes. On the package outside surface the following information shall be clearly indicated:

- Supplier's name;
- Assembly Part Number;
- Product name/type/model;
- Purchase Order number;
- Material description (i.e. steel grade and metallurgy);
- Assembly drawings reference number;
- Instruction/Manual/Technical Data Sheet reference number (these documents shall be handed over to the appointed COMPANY representative);

Equipment shall be suitably protected against corrosion during transit and storage for a period of one (1) year under standard storage conditions.

BIDDER shall advise for any precaution during handling and removal of the coating material, in particular regarding disposal procedure.

Threads shall be protected with plastic blanked off thread protectors. The type requested is "Closed End Liftable" manufactured in compliance with the ISO 11960 Annex-I. The thread protectors shall be obtained from molten plastic material reinforced with steel element, and shall have a pinhole for ventilation.

A long-term environmental protective thread compound shall be applied to the all Equipment threads (e.g. Sucker Rod string) in order to prevent corrosion, pitting etc. while in transit and for a period of one (1) year standard storage conditions.

0 DELIVERY PERIOD

BIDDER shall deliver all the equipments within six months from the date of issue of LOI for Indian bidders and from the date of issue of LC for foreign bidders.

0 TECHNICAL TENDER PROPOSAL REQUIRED DOCUMENT

BIDDER shall submit Technical tender proposal along with the following documents:

Sl. No.	Technical Tender Proposal Required Document
A.01	BIDDER shall compile the 'BIDDER's data' column of 'Apendix-A, B & C in every part and add any additional items that might not be listed, but required to perform the intended Work.
A.02	BIDDER shall provide the detailed technical/functional specifications of each individual item/assembly (Appendix-A, B & C) and of any additional items/assembly as indicated under Sl no A.01.
A.03	Technical drawings (a color coding is highly recommended) of each components and of the service tools/equipment required to perform the intended Work.
A.04	BIDDER shall provide 'as-run' Completion drawing/schematic (for PCP), indicating each completion component's OD, ID (where applicable), thread connection, material grade, metallurgy and length.
A.05	BIDDER shall provide PCP Design and offered Elastomer Compound compatibility test Report
A.06	BIDDER shall submit 'Curriculum-Vitae' of individual, who will be engaged for Installation and commissioning of the equipment.
A.07	BIDDER shall provide documentary evidence confirming their experience. These documents should be in the form of duly attested copies of contracts/work orders/completion certificates/payment certificates etc. issued by clients.
A.08	Bidder shall also provide item wise price of each major unit of the PCP unit as tabulated in Appendix-D for future reference only.

14.0 MODULE–I: Equipment design, Manufacturing and Transportation to COMPANY's designated locations

BIDDER shall design and select most appropriate PCP system based on the information provided and supply two sets of PCP Completion Systems, complete of Drive Head (preparation to house one Electric Motors of 40 HP), Stuffing Box, Polished Rod, Polished Rod end cap and clamp. The Sub-surface Completion equipment shall include the Sucker Rod string, Pony Rod Pup Joints, Sub-surface, Surface Monitoring Equipment and the completion accessories as indicate in the 'Appendix-C'.

BIDDER shall quote for the models of pumps considering 50-100 BPD potential well flow rates scenario.

BIDDER shall validate the PCP size from a detailed screening of COMPANY's operating environment estimated data as presented in 8.3 and well design.
Bidder shall quote keeping into consideration the well head fitting that is being used by Company in the designated wells where PCP will be used. The Production Tubing is of size 2.87" 6.5 ppf API EUE and the casing size is 7" 23 ppf and the Xmas tree is of 5000 psi rating and the tubing hanger used is flange type.

COMPANY requires BIDDER to propose a standardized PCP system design capable to deliver COMPANY's required production range as indicated above. BIDDER shall perform the systems sizing taking into consideration the following additional information:

- The produced fluids from the wells shall be delivered directly to the nearby gathering station located at the well plinth flow line of size 4" OD;

- Most likely the required well head pressure will of about 200 psi.

The electrical power supply will be 415 Volts, 3 (three) phases, 50 Hz ± 5%.

14.1 SURFACE EQUIPMENT: DRIVE HEAD

BIDDER shall provide a suitable Drive Head design built to accommodate 1 (one) Electric Motors (40 HP installed power), complete with the necessary gear reducer mechanism, sheaves, synchronous belts, guards, drive Polished Rod, Stuffing-Box along with necessary safety features for each unit (Back spinning system: hydraulic type is COMPANY's preferred option). The drive mechanism shall be equipped with suitable feature to change the Pump speed to suit the range of production rate.

14.2 SUB-SURFACE EQUIPMENT

Pump Stator and Rotor

BIDDER shall supply the PCP Stator and Rotor with all the required accessories suitable for the well completion and fluids characteristics (Ref. Section 8.3). The PCP shall be capable to handle sand, solids and possibly diluents up to a reasonable extent, without interruption in production and/or minor impact to the intrinsically potential run life. The Pump shall be supplied with the required Crossovers Subs to match the Tubing connections and the Production Casing drift.

BIDDER shall provide the objective evidence of suitability of the proposed Elastomeric Compound as stated in this document.
BIDDER shall provide the detailed technical specifications, the material grade and metallurgy that meets the COMPANY minimum requirements stated in 'Apendix-C', Elastomeric compound cure specifications, connection data and the color coded drawings of the Equipment.

Tag Bar Nipple, Drain Nipple and Seating Nipple

COMPANY requires BIDDER to supply the 'Tag Bar Nipple' as part of the PCP assembly, the 'Drain-Nipple' and the Insert Pump 'Seating-Nipple' with 2.7/8" nom. OD 6.5 ppf EUE by Pin end connections, thus minimizing the need of Crossover Subs.

BIDDER shall provide the detailed technical specifications, the material grade and metallurgy that meets the COMPANY minimum requirements stated in 'Apendix-C', connection data and the color coded drawings of the offered Equipment.

Torque Anchor

BIDDER shall supply suitable 'Torque-Anchor' to be installed in conjunction with the PCP assembly in order to prevent any rotation of the Tubing while the Pump is in operation.

The proposed wells shall be completed with down hole heater and diluent injection hardware. The Torque anchor shall be capable to accommodate diluents injection string and Down hole heater cable.

BIDDER shall provide the detailed technical specifications, the material grade and metallurgy that meets the COMPANY minimum requirements stated in 'Apendix-C', connection data and the color coded drawings of the offered DEVICE.

14.3 MONITORING EQUIPMENT

Down hole Pressure and Temperature Gauges

The down hole Pressure and Temperature Gauges shall be capable of measuring the following five variables:

1. Pump Intake Pressure;
2. Pump Intake Temperature;
3. Pump Discharge Pressure;
4. Pump Discharge Temperature;
5. Pump Vibrations;

BIDDER shall provide the detailed technical specifications, the material grade and metallurgy that meets the COMPANY minimum requirements stated in 'Apendix-C' and the color coded drawings of the offered DEVICE.

Down hole Gauges Carrier Mandrel

COMPANY requires BIDDER to supply the 'Gauge Carrier Mandrel' with 2.7/8" nom. OD 6.5 ppf EUE Box by Pin end connections, thus minimizing the need of Crossover Subs.

BIDDER shall provide the detailed technical specifications, the material grade and metallurgy that meets the COMPANY minimum requirements stated in 'Apendix-C', connection data and the color coded drawings of the offered DEVICE.

Armored Instrument Cable (TEC Line)

The Instrument cable must be compatible with the Pressure and Temperature Gauge sensors. The instrument line shall have the following specifications: ¼" nom. OD x 0.035" wall thickness seamless Tubing, material grade: AISI 316L, encapsulated (encapsulation material to be ETFE, 11 x 11 mm).

Electrical Transient Protection shall meet IEEE Standard 587 and 472 Category B compliant. The Well Head TEC line termination (Exit-Block) shall fit COMPANY Well Head connection requirements, shall be 'Explosion-Proof' rated and 5,000 psi working pressure.

BIDDER shall provide the detailed technical specifications, the material grade and metallurgy that meets the COMPANY minimum requirements stated in 'Apendix-C', connection data and the color coded drawings of the offered DEVICE.

Cross Coupling Protector Clamps (CPPC)

BIDDER shall supply Cross-Coupling-Protector-Clamp (CCPC) designed for the 2.7/8" nom. OD 6.5 ppf EUE Tubing Coupling connections.

The CCPC design shall provide 3 (three) slots respectively to house the 3/8" nom. OD diluents injection line, Mineral insulated cable and the ¼" Instrument Line (TEC Line).

The CCPC shall be designed to ensure that no locking mechanism part could become loose during it installation, i.e. avoiding the risks that washers, nuts or other locking mechanism component could fall into the well bore.

Down hole Gauges Surface Data Acquisition (Data Logger)

The downhole Gauges Surface Data Acquisition (Data Logger) COMPANY's minimum required is provided in 'Apendix-C'.

The Data Logger shall be supplied with the all the necessary equipment required for a proper grounding.

Data logger shall have protection against electrical transients. Wall bracket may be required.

14.4 SUCKER ROD STRING, POLISH ROD AND PONY ROD

COMPANY requires BIDDER to supply the entire length of Sucker Rod string required to operate each PCP Completion System at the given well depth of maximum 1300 m.

COMPANY's minimum requirements:

- Sucker Rod size and Joint length: 1" x 25 ft. long;
- Connection: 7/8" API Pin;
- Material Type: Ultra High Strength;
- Material Grade: AISI A-4330-M (Ni-Cr-Mo Alloys);
- Reference standard: ISO 15136 Part 1 Latest Edition;

The Sucker Rod string and the Pony Rods (i.e. Pup Joints) shall be manufactured in full compliance with API RP 11B and ISO 15136 Part 1 standards.

All the connections shall be doped with a long term storage compound and protected by plastic thread protectors during transportation, handling, storage and long term storage (i.e. for a minimum of 2 (two) years).

Sucker Rods and Pony Rods shall be packed and stored in compliance with the API recommendation to prevent damage during the material handling and transportation. Extreme care shall be taken to prevent stresses due to cold bending of rods when these are lifted.

BIDDER shall provide the detailed technical specifications, the material grade and metallurgy that meet the COMPANY minimum requirements stated in 'Apendix-C', connection data and the color coded drawings of the offered DEVICE.

14.5 CRITICAL SPARE PARTS

BIDDER shall provide a list of recommended spare & consumable list to cover 2 (two) years of trouble free continuous operations. COMPANY may purchase the proposed spares parts or part of. Recommended spare & consumable cost should be valid for 2 years from the date of issue of Letter of Award (LOA).

BIDDER shall submit the list of recommended spare parts/consumables required for smooth operation of the equipment for 2 years, along with quantity and rate as per the format below. It may be noted that the **Technical Bid** should include the **Un-Priced** list of the spares & consumables with quantity and the **Priced Bid** should indicate the **Price(unit rate**).

Item No.	Part Number	Detailed Item Description	First Year				Second Year				Remarks
			Qty	UOM	Unit Rate (Currency)	Total (Currency)	Qty	UOM	Unit Rate (Currency)	Total (Currency)	

15.0 ELECTRIC MOTOR AND VARIABLE SPEED DRIVE:

BIDDER shall supply 'Electric-Motor' (EM), 'Variable-Speed-Drive' (VSD), hereinafter called VSD, the 'Electric-Power-Supply-Cable' (EPSC), the 'VSD-Power-House' (VSD-PH) and all the related miscellaneous equipment required to perform the intended work.

Equipment Sizing:

The sizing of the EM and VSD should be carried out considering the design of 'Progressive-Cavity-Pump' (PCP) systems.

The VSD will be installed indoor (i.e. in the VSD-PH); each VSD Unit can be supplied with an IP 55 compliant cabinet, which should represent the most cost effective option. BIDDER shall supply the VSD-PH that met the following indoor operating environment conditions:

a) Temperature range: 30°C +/-2°C;
b) Relative Humidity: 50% +/-5%;
c) If mechanical cooling fails, equipment shall withstand without any damage or degrading a temperature of 50°C and maximum 40% relative humidity.

The electric motor, motor terminal box, cable glands, junction box etc. (at motor end) shall be flameproof and suitable for use in Gas Groups IIA and IIB in Hazardous areas (Zone 1 and Zone 2) of oil mines. Cable glands shall be double compression type.

The 'Electric-Motor' (EM) shall be induction (asynchronous) and must be designed to be used and powered by a VSD. The EM shall be certified by CIMFR (Central Institute of Mining and Fuel Research) or any NABL accredited, Govt. approved test laboratory and approved by DGMS, India. Other flameproof items like junction box, glands etc. shall be certified by a testing laboratory as above.

BIDDER shall supply 'Electric-Power-Supply-Cable' (EPSC) and all the miscellaneous equipment/components/parts such as Junction-Box, gland, connector, and insulation material to

connect the EM to the VSD. BIDDER shall provide the detailed EPSC sizing calculation, insulation and armored selection, data sheet and technical specifications.

The electrical power supply will be three phase, 415 VAC (+10%) and 50 Hz (+/- 5 Hz) through a dedicated generating set (i.e. Genset).

Electric Motor General Requirement:

BIDDER shall provide EM with adequate torque to suitably start, accelerate and operate the driven equipment i.e. PCP system and as per the IEC-60034 standard. In addition EM shall be sized to provide sufficient torque to start and accelerate the driven load at 80% Voltage.
EM shall be single shaft extension sized in accordance with IEC standards and with shaft extension suitable for the PCP Drive Head. EM mounting arrangement shall be in full compliance with IEC 60034-7.

EM enclosure shall withstand, without any damages, all stresses that can occur during starting, normal operation, sudden stop, short circuit and, where applicable, reacceleration in phase opposition with the residual voltage. The EM enclosure shall be in full compliance with IEC 60034-5.

EM housing shall be made of cast iron. Junction Box and end bells shall be made of cast iron or fabricated steel. The materials used for windings, rotor bars and end rings shall be copper. Asbestos, asbestos-containing materials and polychlorinated biphenyls (PCBs) shall not be used. All electrical components shall be designed for desert environment. All equipment and component materials shall be new and unused.
EM bearing housing shall be provided with covers or end caps which are readily removable or can be backed off without dismantling the EM. In addition the grease fitting and relief plug shall be located as to ensure complete lubrication of the bearing rolling element. Bearing shall be selected to have a rated life of 44,000 hrs (i.e. five (5) years), calculated in accordance with ISO R281.

The direction of Rotor rotation shall be indicated on the non-driving end by means of permanently marked arrow. Painted arrow will not be acceptable. Cooling fans shall be made of ‘non-sparking’ material.

EM name plate shall be stainless steel or aluminium, fixed to a non-removable part of the Motor enclosure with stainless steel screws. EM name plate shall conform to IEC-60034-1 standard.

The EM will be equipped with an appropriate ‘Junction-Box’ (JB) to connect the multi wire VSD compliant Power Supply Cable. The minimum acceptable size for the cable entry shall be provided. The JB shall be located on the top side of the EM housing and must be in full compliance with NEMA specifications.

The Junction Box (JB) connection terminals must be clearly marked, screw type, cable terminals or compression-type eye. One of the terminals will be used for grounding the motor. The boxes should be widely sized terminal that meets the minimum requirements specified in IEEE Standard 841, so that the EM power supply wires and thermistors can be connected without damage. The connection on the EM should be at 415 V Delta using cables with eye terminal.

JB shall allow the removal of the EM without damaging or stressing the cable sealing. EM power lead terminal boxes and terminal blocks (or stand-offs) shall be large enough to easily allow the connection of the incoming circuit conductors.

JB shall be minimum IP 55 and located on the right side of the EM and that either top, side or bottom entry of the Power Cable may be achieved. BIDDER shall provide Zone 1 rated Cable Glands for armoured wire Cable.

EM shall have provision of ground lugs in main terminal box and on terminal box side of the frame. Ground lugs shall be of at least 6 mm diameter and well identified.

EM noise level shall be of 85 dBa or less at 1 m. from the source of noise. The EM vibration level shall not exceed the limits specified in the IEC-60034-14 (severity grade N shall apply).

BIDDER shall provide EM, which is to be driven by Active- Front-End/Regenerative type VSDs.

EM weighting above 20 Kg. shall be provided with one or more lifting eyebolts. The same requirement applies for any individual components over 20 Kg that need to be removed at times for routine maintenance purposes.

BIDDER shall provide the detailed technical specifications that meets the COMPANY minimum requirements stated in 'Apendix-A', connection data and the color coded drawings of the offered device.

Regenerative/AFE Variable Speed Drive

The 'Variable-Speed/Frequency-Drive' (hereinafter called VSD) shall be capable to limit the 'Total-Harmonic-Distortion' (THD) on the upstream power supply system to less of 5% as a in full compliance with the in IEEE 519, 1992 standard.

BIDDER shall supply the latest generation of 'Insulated-Gate- Bipolar-Transistors' (IGBT) for both the Rectifier and Invertor, i.e. Regenerative/Active-Front- End VSD.

The Regenerative/Active-Front-End VSD shall include one pre-charge circuit with 'LCL' filter and 'Line Inverter' with the latest generation of IGBT´s in the 'Rectifier' section and in the 'Inverter' section. Control of logic functions will be accomplished through microprocessor of the latest technology and integrated control system.

The VSD shall comply as a minimum with the following requirements:

VSD Construction Minimum Requirements:

The VSD shall be design and manufactured for an easy access to the entire components in order to facilitate maintenance and troubleshooting.

The VSD parts shall be designed to permit an easy access to control modules and printed circuits boards. The placement of components, test points and terminals shall permit easy access for circuit checking, adjustments, troubleshooting and maintenance from the front of the enclosure without removing any adjacent module or VSD Cabinet.

Electromagnetic Interference (EMI) shall be minimized to ensure that the sensitive electronics in the converter and other computer system operation are not adversely affected. All applicable IEC 61000 series standards (in particular, IEC 61000-2-4) shall be fulfilled.

All power buses shall be made of copper. The short circuit rating shall be capable of withstanding let through current capability of the isolation transformer rating. All bolted power bus connections shall be made of corrosion resistant material and be secured with corrosion resistant, silicon-bronze

hardware, including bolts, locking washers and nuts or jam nuts. Connections shall be made with a minimum of two bolts.

The bus shall be designed to carry the maximum short time current expected for minimum 2 seconds. The heartening bus shall be rated for the available short-circuit current and electrically connected together all metallic parts of the assembly. Provisions for connection of two holes connectors at each end of the heartening bus shall be provided.

The VSD Cabinet shall be manufactured with stainless or galvanized steel or aluminium or cast aluminium. All hardware furnished with the Cabinet, i.e. hinges, handles assemblies, lock assemblies, latching assemblies, etc. shall be made of metal treated against corrosion. VSD Cabinet shall be properly identified. Identification shall consist of a Stainless Steel Plate with black letters on a white background.

The Cabinet shall have bottom entry preparation for the EM Power Supply Cable.

The VSD Cabinet shall be treated and packaged for desert environment.

Main power terminal shall be clearly marked.

All warning and instruction nameplates shall be written in English.

Termination points for all wiring brought from an external power source shall be identified by a red nameplate with 6 mm or higher white lettering as follows: **DANGER – EXTERNAL VOLTAGE SOURCE.**

(A) Optimum Characteristics

The VSD shall be capable to deliver 100% 'Regenerative Power Feedback' without the need for an autotransformer. Even during regenerative mode, power losses should not occur as in the case with a breaking resistor. The transition from motoring to regenerative mode shall be very quick, with pulse-frequency response. The voltage DC link shall be regulated to ensure optimum supply of the drive 'Inverter' and almost independently of the supply voltage.

(B) Minimal Network Perturbation

The VSD shall be so designed that the harmonics and commutating dips are avoided, except for a very small residue. Optimum matching between the electronically controlled 'Active' section and the 'Passive' section shall ensure that an almost sinusoidal voltages and currents will be impressed in the direction of the supply, therefore avoiding occurrence of network perturbations.

(C) VSD Operability under power off Transients Conditions

In the event that the VSD power supply voltage moves outside the permissible range or **if it fails completely**, the VSD shall be able to take all the necessary actions and protections through it electronic features to resume the normal working conditions within seconds. The VSD shall automatically resume the EM and therefore the PCP set rotating speed after the returning of the line voltage within the acceptable amount of time.

(D) User Interface Pad

The VSD Unit shall have a moisture protected 'User-Interface-Pad' mounted at the front side of the IP 55 (min) VSD Cabinet for and easy access to the Operator. The 'User-Interface-Pad' is to allow the monitoring, adjust and control the VSD operating parameters.

The 'User-Interface-Pad' shall have an alphanumeric programmable high resolution display with status indicators that can be displayed in English with at least 6 (six) lines x 24 (twenty four) characters.

The 'User-Interface-Pad' shall permit the following actions:

(i) VSD start up configuration;
(ii) Control the VSD with a reference signal: start, stop and EM rotation direction commands;
(iii) Show updated data on real time;
(iv) Show and adjust parameters;
(v) Show failure data on real time;
(vi) Display diagnostic messages;
(vii) Adjust display contrast for a perfect data reading under normal ambient light conditions.

(E) VSD Control Functions

Frequently accessed VSD programmable parameters shall be adjustable from 'User- Interface-Pad' (Ref. to item D), however standard and advanced programming, troubleshooting functions shall be managed through a Personal Computer's USB port and a VSD specific Windows™ (latest version such as Windows 8.1 or 10) based software application. BIDDER software application shall permit the control and monitoring of the VSD via the VSD's to Personal Computer communication port. BIDDER shall supply the required application software on an USB Pen Drive/DVD.

Software application shall be supplied with the related User Manual and the built in Help feature. BIDDER shall support the software maintenance ideally through a web base application, where new software versions or troubleshooting patches can easily be downloaded. The software application shall also allow modifying the VSD setup, to download diagnostic and trend information. The VSD´s communication port shall be located in a safe moisture protected and accessible place.

The VSD Operator shall be able to scroll through the 'User-Interface-Pad' menu to choose among the following:

(i) Operating parameters monitoring;
(ii) Configuration of parameters units and/or data setup;
(iii) Actual parameter values;
(iv) Active faults and/or alarms;
(v) Fault history;
(vi) LCD contrast adjustment;
(vii) Loaded software version and upload date;

The following setups and adjustments shall be available, but not limited to:

(i) Start command from keypad, remote or communications port;
(ii) Speed command from the keypad, remote or communications port;
(iii) Selection of motor direction;
(iv) Maximum and minimum speed limits;
(v) Acceleration and deceleration times (two settable ranges);
(vi) Critical (skip) frequency avoidance;
(vii) Star up Torque limit;

(viii) Running Torque limit;
(ix) Multiple attempt restart function;
(x) Multiple preset speeds adjustment;
(xi) Catch a spinning motor start or normal start selection;
(xii) Programmable analog output;
(xiii) DC brake current magnitude and time;
(xiv) Proportional/Integral process controller;
(xv) Current/Torque limit;
(xvi) Manual Operation, activation and setup;
(xvii) Slip compensation;
(xviii) Slip Ramp activation and setup;
(xix) Flying start enabling and setup;
(xx) Bus regulation;
(xxi) Phase loss detection;
(xxii) Compensation;
(xxiii) Enable and setup the Boost;
(xxiv) Setup of heat sink temperature trip;

The variable frequency, variable voltage AC controller shall be vectorial sensorless type and suitable for:

(i) 110% min. overload for thirty (30) minutes (variable torque load only);
(ii) +10%, -10% input voltage variations for 1% output voltage regulation;
(iii) Output voltage range as required for PCP operation;
(iv) Output Frequency: as required for PCP operation;
(v) Start Frequency: as required for PCP operation;
(vi) Frequency Resolution: +/- 0.1 Hz:
(vii) Volts/Hertz: 0.7 – 10 Volts;
(viii) Adjustable linear acceleration range to match pump-operating range:
(ix) Acceleration Time: 3 to 1,000 Sec.;
(x) Deceleration Time: 3 to 1,000 Sec.;
(xi) Instantaneous Over Current (OIT): 170% of Full Load Rating;
(xii) Adjustable volts per hertz;
(xiii) Remote control by 4-20 mA process signal;
(xiv) Convection air cooling;
(xv) High efficiency (≥ 98% at rated load);
(xvi) High power factor: 1 or greater at any speed or load;

Controller electronic shutdown shall be initiated by:

(i) Overload in excess of 110% for thirty (30) minutes and short circuit current;
(ii) High DC input voltage;
(iii) Low AC incoming line voltage (70% below 415 VAC); however, the output will be reduced, without faulting, after 90% of supply voltage.
(iv) Motor thermal overload signal. The manual reset shall be located at the electronic power supply module;
(v) Thermistor input motor over temperature protection;
(vi) Single phasing;
(vii) Instantaneous fault (short-circuited output);
(viii) Line to ground fault;

(F) Communications

The VSD shall at least comply with the following minimum requirements:

(i) The VSD shall be provided with Ethernet, RS-485 and USB ports to connect the VSD Control Unit to a Personal Computer (Ref. to item E);
(ii) The VSD shall be provided with the all necessary hardware to allow monitoring and control the VSD (via a fibre-optic cable or a direct plug-in) from a remote location;

(G) User Interfaces and wire labelling

The VSDs shall be supplied as a minimum with the following interfaces and accessories:

(i) The VSD shall be provided fully wired in the IP 55 (min) Cabinet and with 'User-Interface-Pad' connected and ready for the operations. BIDDER shall provide the detailed electric and electronic wiring schematic/drawing as part of the Technical Tender documentation;
(ii) Push buttons and indicating lights shall be at least of 22.5 mm diameter and designed for heavy duty applications; the indication lamps shall be high-intensity (for viewing in normal ambient daylight) LED type with LVGP (low voltage glow protection).
(iii) Clamp type terminal blocks shall be provided for all wires complete with marking tabs and wire number. BIDDER shall provide the detailed electric and electronic wiring schematic/drawing as part of the Technical Tender documentation;
(iv) Internal control wiring shall have ring or sleeve type wire labels;
(v) The VSD shall be provided as a minimum with the following 'Input', 'Output' user interface signals:

6 (six) Digital 'Inputs' of 24 VDC (individually galvanic isolated). The VSD shall accept the following Digital 'Inputs':

a) Start/Stop command;
b) ESD Stop command;

3 (three) Digital 'Output' relays of 24 VDC switchover contact of max. 2A. The VSD shall supply the following signals as digital outputs:

a) Running Status;
b) PCP Fault indication;
c) PCP Shut Down indication (PCP S/D);

(vi) In the event of loss of an analog input reference signal, the VSD shall be user programmable to deliver the following information:

a) Fault and stop;
b) Alarm and go to preset speed;
c) Alarm and go to minimum speed;
d) Alarm and go to maximum speed;

(vii) The 'Input' and 'Output' signals listed above shall be programmable as minimum for the following functions:

Digital Input:

a) Start Forward;

b) Start Reverse;
c) Run Enable;
d) Reverse;
e) External Fault Input;
f) Fault Reset;
g) Multi-step Speed Select 1;
h) Multi-step Speed Select 2;
i) External Motor Overload Trip;
Digital Output:
a) Ready;
b) Run;
c) Fault;
d) Fault inverted;
e) Overheat warning;
f) External fault or warning;
g) Reference fault or warning;
h) Warning;
i) Reversed;
j) Multi-step speed selected;
k) At speed;
l) Motor regulator activated;
m) Output frequency supervision;
n) Control from I/O terminals;

Analog Input:

a) Process control speed reference interface;

Analog Output:

a) Motor current;
b) Motor frequency;
c) Motor speed;
d) Motor torque;
e) Motor power;
f) Motor voltage;
g) DC link voltage;

(viii) The VSD should display the following monitoring functions as a minimum:

a) Output frequency;
b) Motor speed;
c) Pump speed;
d) Motor current;
e) Motor torque;
f) Pump torque;
g) Motor power;
h) Motor voltage;
i) DC-link voltage;
j) Time to restart;
k) Heat sink temperature;
l) Total operating days counter;
m) Operating hours (resettable);

n) Total megawatt hours;
o) Megawatt hours (resettable);
p) Voltage level of analog input;
q) Current level of analog input;
r) Digital inputs status;
s) Digital and relay outputs status;
t) Motor temperature rise, percentage of allowable;

(H) VSD Built In Protection

The VSD shall have comprehensive safety and protection features in the event of any internal or external faults conditions.

The VSD shall be supplied as a minimum with the following protection functions:

a) Output Over current;
b) DC link Overvoltage;
c) Inverter fault;
d) DC link Under voltage;
e) Input Voltage Phase loss;
f) Output phase loss;
g) Under-temperature;
h) Over-temperature;
i) Motor blocked;
j) Motor over-temperature;
k) Motor under load or loss detection;
l) Logic voltage failure;
m) Microprocessor failure;
n) DC injection breaking;
o) Phase Reversal (Failure or Warning);
p) Over frequency to the VSD output;

The VSD shall constantly monitor the heat sink temperature.

The VSD shall provide ground fault over current protection during power-up, start up, and running.

Additional Protections at the input of the VSD should be provided such as:
a) Phase loss;
b) Under load;
c) Current unbalance;
d) Ground (Earth) fault;
e) PTC Thermistor monitoring;

The VSD shall be supplied with overvoltage protection that will de-energize and isolate the VSD during prolonged input overvoltage. The overvoltage protection setting shall be specified by the BIDDER and selected in order to prevent any damage to the VSD. The overvoltage setting should not be below 120% of VSD's rated input voltage.

(I) VSD Application Software

The VSD application software must run by the built in Drive Control Board[1].

Note **1**: External controller is not acceptable.

The following PCP control functions are set as COMPANY minimum requirements:

a) Protect the Rod String from unnecessary stress by accurately controlling the Rod String speed/torque;

b) Back Spin Control. Parameters of reverse speed must set and limit torque. Breaking Resistor system is not acceptable;

c) Protect the Rod String from sudden load changes, minimizing Rod String stretch and compression;

d) Fluid level Control. The drive must receive the Pump Intake and Discharge Pressure and control the fluid level by a User Set point. The drive speed therefore increase or decrease automatically to match the fluid level set point;

e) Pump-on, Pump-off Control. If the fluid level goes below the user set point, the Rod String speed shall go to 0. The VSD will automatically wait until that the fluid level goes up again above the fluid level set point and re-start automatically and return gradually to the reference speed;

The following parameters shall be used to control and protect the PC-Pump operations:

a) Pump Speed;
b) Motor Speed;
c) Pump Torque;
d) Motor Torque;
e) Discharge Pressure;
f) Intake (Casing) Pressure;
g) Pump Temperature;
h) Active Power;
i) Input Voltage;
j) Output Voltage;

BIDDER shall provide the detailed technical specifications that meets the COMPANY minimum requirements stated in 'Apendix-B', connection data and the color coded drawings of the offered device.

16.0 Bidder shall have to furnish the unit rate of various components of the offered PCP as detailed in Appendix-D in the **PRICED BID.** The Un-Priced list to be uploaded along with the Technical Bid.

17.0 Module 2: Equipment preparation, installation, commissioning and start-up;

BIDDER shall unpack, clean, prepare, carry out all the necessary test before installation, commissioning and Start-up. Applicable Charges during installation and commissioning are as under:

BIDDER shall submit a detailed 'step-by-step' preparation and installation procedures of EDHH system.

BIDDER undertakes the responsibility to install, commissioning and start-up the equipments at the COMPANY designated wells.

The BIDDER's Supervisor will be fully responsible for the onsite equipment preparation and installation in full compliance with the agreed and accepted Standard Operating Procedure (SOP) in liaison with COMPANY and drilling Bidder representatives. Upon job completion the BIDDER Supervisor shall prepare a complete post installation report in the format previously agreed and accepted by COMPANY.

BIDDER's personnel are required to carry out the assigned activities and shall mobilize their personnel for Installation and Commissioning of the equipment on receipt of 'call out' notice from the COMPANY after receipt of equipment within a period of 1 (one) year.

No additional cost shall be paid by the COMPANY in the event of re-installation of the equipments due to fault of the equipments. BIDDER shall install and start-up the equipment to the satisfaction of the COMPANY.

17.1 APPLICABLE CHARGES

Installation, commissioning and start-up charges shall be paid on lump-sum basis. The charge shall include cost of manpower, material and equipment, including conveyance, required for preparation, installation and commissioning of Equipments. Required Rig service shall be provided by the COMPANY.

17.2 BIDDER PERSONNEL FOOD AND ACCOMODATION

COMPANY shall provide food and accommodation to BIDDER Personnel at COMPANY Well site during installation and commissioning of the equipment (Module-II) without any charge.

17.3 BIDDER EXPERIENCE

BIDDER shall have a minimum 3 (Three) years experience in the relevant field. Documents establishing successful execution of contract must be submitted along with the technical bid. These documents should be in the form of duly attested copies of contracts/work orders/completion certificates/payment certificates etc. issued by clients.

17.4 BIDDER PERSONNEL

THE BIDDER SHALL PROVIDE COMPETENT PERSONNEL TO ENSURE TROUBLE FREE OPERATION, AS APPROPRIATE, BUT WITHOUT LIMITATION TO THE FOLLOWING ON ROUND THE CLOCK BASIS.

BIDDER Project Co-ordinator

Project Co-ordinator is responsible for the coordination, support, skilled advice/supervision and quality control (QC) review throughout the design, planning, preparation and execution phase of the activities performed by BIDDER and/or SUBBIDDER as specified within the Scope of Work.

BIDDER PC-Pump Application Engineer

The BIDDER position holder is responsible for PCP system sizing/design, and material selection.

The BIDDER PC-Pump Application Engineer should have minimum 2 (two) years of experience in the relevant field.

BIDDER Installation and Commissioning Supervisor and Team

The BIDDER's position holder is responsible for the equipment preparation, installation and commissioning in compliance with the agreed COMPANY Installation and Commissioning Procedures.

The bidder has to mobilize their personals for installation and commissioning within a period of 30 days from receipt of notice for the same by the Company.

The mobilization notice will be issued by the Company to the Bidder within 1 year from receipt of material by the Company.

The BIDDER's Installation and Commissioning Supervisor and the team member should have minimum two (2) years of experience in the relevant field.

BIDDER shall provide competent personnel to ensure trouble free operation as appropriate on round the clock basis.

Bidder has to complete successful completion of installation and commissioning of each unit at company's designated well within a period of 30 days from the start of installation and commissioning in each well.

BIDDER shall be responsible for all the activities carried out under their respective domain. However, single point responsibility shall be entrusted to the Project Coordinator.

The BIDDER must furnish along with the bid the bio-data and supporting documents regarding the experience of all the crew members to be deployed under the contract.

BIDDER personnel should be conversant with the relevant safety practices.

If the Bidder is unable to provide the personnel initially identified in their offer and seek for deployment of alternate personnel having requisite qualification and experience set forth in the bid documents, BIDDER shall have to obtain prior approval from COMPANY for the same.

Transportation to and fro from COMPANY well site to BIDDER Base office shall be responsibility of the BIDDER.

18.0 SAFETY, HEALTH and ENVIRONMENT:

BIDDER shall comply with applicable environmental laws, statutory regulations as applicable to Oil Mines in India.

The BIDDER shall provide all its personnel to be deployed during installation and commissioning of the equipment (Module-II), with Personal Protective Equipment as per international practice, which may include, as appropriate, but without limitation the following:

- Safety Helmet
- 100% cotton or fire proof overalls
- Safety Foot ware

- Safety Goggles
- Other PPE, including gloves, hearing protection etc.

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SECTION-II

SPECIAL CONDITIONS OF CONTRACT

1.0 Payment Terms:

1.1 Advance payment shall not be made by Company to the Bidder against this contract. Company shall release payment to the Bidder as per the following schedule after deducting income tax and liquidated damages etc., as applicable, within 30 days from the date of receipt of undisputed invoices. Payment shall be released in two parts, first part is for supply of material and second part after installation and commissioning as under :

(a) 70% of supply value shall be released through bank against proof of dispatch along with relevant supporting documents as per the terms of the tender/order.

(b) Remaining 30% of supply value shall be released along with the Installation & Commissioning charges after successful completion of Installation and Commissioning of the equipment, deducting liquidated damage, if any.

2.0 **Liquidated Damages:**

2.1 The Bidder shall be liable to pay liquidated damages at the rate of 0.5% per week or part thereof upto a maximum of 7.5% on the value of supply/installation & commissioning, in the event of default by the Bidder as under :

a) In case of delay in supply beyond the scheduled delivery date, LD will be applicable on supply value.

b) The bidder has to mobilize their personnel for installation and commissioning within a period of 30 days from the date of notice for the same. In case the bidder is not able to mobilize its personnel within the stipulated period as mentioned (30 days), LD will be applicable on installation and commissioning charges.

c) In case the bidder, is not able to complete the installation & commissioning of the equipment at company's designated well within 30 days from the start of installation & commissioning, LD will be applicable on installation & commissioning charges.

3.0 **Insurance:**

3.1 Bidder must cover all their equipment and manpower with adequate insurance coverage as deemed fit. Company will not assume any responsibility whatsoever in the event of any eventuality to the Bidder's resources during job execution against the contract. Company reserve the right to demand a copy of such insurance coverage/policy for record.

4.0 **Taxes and Duties:**

4.1 Tax leviable as per the provisions of Indian Income Tax Act 1961 and any other enactment/rules on income derived/payment received against this agreement will be on Bidder's account. The rates agreed and entered in to herein are inclusive of all such taxes, duties and levies, except "Service Tax.

Responsibility to pay service tax lies with **foreign service provider/Bidder** if they are registered in India under service tax provisions and responsibility of service tax payment lies with Company if **foreign bidder** is not registered in India under service tax provisions.

4.2 Tax will be deducted at source from all payments released to the Bidder, at the specified rate of income tax as per provision of Indian Income Tax Act 1961.

4.3 Bidder shall be responsible for and pay the personnel taxes and Service Tax, as applicable.

4.4 Bidder shall furnish the Company, if and when called upon to do so, relevant statements of accounts or any other information pertaining to work done under this agreement for submitting the same to the tax authorities, on specific request by them. Bidder shall be responsible for preparing and filing relevant returns within the stipulated time to the appropriate authority.

4.5 Tax clearance certificates shall be obtained by the Bidder from appropriate authorities and shall furnish the same to Company if sought for.

5.0 Subsequently Enacted Laws:

5.1 Subsequent to the date of submission of bid, if there is a change in or enactment of any Indian law which results in an additional cost or reduction in cost against this contract to Bidder, such additional cost shall be reimbursed by Company to Bidder on submission of documentary evidence that the Bidder has duly borne the additional implication as envisaged under the said law or such reduction in cost shall be refunded by Bidder to the Company as the case may be.

6.0 Applicable Laws:

6.1 The contract shall be deemed to be an agreement made under, governed by and construed in accordance with the laws of India.

6.2 Bidder shall ensure full compliance of various Indian Laws and statutory regulations as stated below, but not limited to, in force from time to time and obtain necessary permits/licenses etc. from appropriate authorities for conducting operations under the agreement.

(a) Mines Act 1952 – as applicable to safety and employment conditions.
(b) Oil Mines Regulations, 1984
(c) Workmen's compensation Act, 1923
(d) Payment of wages Act, 1963
(e) Payment of bonus Act, 1965
(f) Contract labour (Regulation & abolition) Act, 1970
(g) Employees Provident Fund and Family Pension Scheme
(h) Interstate migrant workmen Act, 1979
(i) Income Tax Act
(j) Customs and Excise Act & Rules
(k) Insurance Act
(l) Minimum Wages Act, 1948
(m) Service Tax Act

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SECTION-III

BID EVALUATION CRITERIA/BID REJECTION CRITERIA

A) BID REJECTION CRITERIA (BRC):

The Bid shall conform generally to the specifications and terms and conditions including the scope of work/supply given in the bidding document. Bids will be rejected in case services offered do not conform to the required parameters stipulated in the technical specifications/scope of work/terms of reference. Notwithstanding the general conformity of the bid to the stipulated specifications/terms, the following requirements will have to be particularly met by the bidders without which the same will be considered as non-responsive and rejected.

1 TECHNICAL

1.1 The bidder should have experience of Design, manufacturing, supply and installation of equipment/material as specified in Broad scope work of the tender document.

1.2 The bidder must have successfully carried out at least one such order in previous 5 (five) years to be reckoned from the original stipulated bid closing date of the tender.

Bidder having experience of successfully completed similar order, should be costing not less than the amounts equal to INR 28.55Lacs (= US$ 41,327) in preceding 5 (five) years.

(Note: Documents establishing successful execution as above must be submitted along with the techno-commercial bid. These documents should be in the form of duly attested copies of

contracts/work orders/completion certificates/payment certificates etc. issued by clients, failing which offer will be rejected.)

1.3 The bidder shall have an annual financial turnover of minimum INR 28.55Lacs (= US$ 41,327) during any of the preceding 03(three) financial years reckoned from the original bid closing date.

1.3.1 In case of Consortium, the leader of the consortium shall have an annual financial turnover as mentioned in para 1.3 above and the other members of the consortium should meet minimum turnover of INR 14.28 Lacs (= US$ 20,663) during any of the preceding 03(three) financial years reckoned from the original bid closing date.

1.3.2 "Net Worth" of the bidder should be positive for the preceding financial/ accounting year.

1.3.3 Documentary evidence in the form of Audited Balance Sheet and Profit & Loss Account for the preceding 03(three) financial/accounting years should be submitted along with the technical bid.

1.3.4 In case the Audited Balance sheet and Profit Loss Account submitted along with the bid are in currencies other than INR or US$, the bidder shall have to convert the figures in equivalent INR or US$ considering the prevailing conversion rate on the date on which the Audited Balance Sheet and Profit & Loss Account is signed. A CA Certificate is to be submitted by the bidder regarding converted figures in equivalent INR or US$.

1.4 Bidder should be able to provide services of adequately qualified and trained/experienced key-manpower for intended work as specified under Para 17 of SECTION – I. Technical bid should include bio-data of the personnel proposed to be deployed which shall comply with the requirements, failing which the offer will **not** be accepted.

1.5 Bids which do not include all the jobs/services mentioned in the tender document will be considered as incomplete and rejected.

1.6 Bids from Indian Company / India Joint Venture Company with Technical Collaboration/ Joint Venture Partner:

a) In case, the bidder is an Indian Company / Indian Joint Venture Company, who meets the experience criteria as per clause No.1.3 but do not meet criterion as per clause No. 1.1 and 1.2 above, may also bid on the strength of Technical Collaborator / Joint Venture Partner who meets the criteria laid down at clause No. 1.2.

b) Indian bidders quoting based on technical collaboration/ joint venture, shall submit a Memorandum of Understanding (MOU) / Agreement with their technical collaborator/ joint venture partner clearly indicating their roles under the scope of work which shall be addressed to OIL and shall remain valid and binding for the contract period under this tender.

1.7 Bid from Consortium of companies:

In case, the bidder is a consortium of companies, the following requirement should be satisfied by the bidder:

a) The Leader of the consortium (Principal Bidder) shall have experience of Design, Manufacturing, supply and installation of Progressive cavity pump and satisfy the minimum experience requirement as per clause No. 1.1 and/or 1.2 above.

b) If the Leader of the consortium (Principal Bidder) does not fully meet the requirement as per clause No. either 1.1 or 1.2 above, then the shortfall shall be individually met by any of the consortium members. In case, the leader satisfies only Clause No. 1.1 above, then any of the consortium

members individually shall meet clause No. 1.2 mentioned above. Or incase, the leader satisfies only Clause No. 1.2 of SECTION-II, then any of the consortium members individually shall meet clause No. 1.1 above.

c) The LEADER or any of the other consortium members individually shall have to meet the financial criterion mentioned in Clause No. 1.3 above.

d) Consortium bids shall be submitted with a Memorandum of Understanding between the consortium members duly signed by the authorized Executives of the consortium members clearly defining the role/scope of work of each partner/member, binding the members jointly and severally to the responsibility for discharging all obligations under the contract and identifying the Leader of Consortium. Unconditional acceptance of full responsibility for executing the 'Scope of Work' of this bid document by the Leader of the Consortium shall be submitted along with the Techno-commercial bid.

e) Only the Leader of the consortium shall buy the bid document, submit bid and sign the contract agreement (in the event of award of contract) on behalf of the consortium.

f) The Bid Security shall be in the name of the Leader of the consortium on behalf of consortium with specific reference to consortium bid and name & address of consortium members. Similarly the Performance Security shall be submitted by the Leader on behalf of the consortium.

1.8 Bidder(s) quoting in Collaboration / joint venture Partnership/ Consortium with any firm are not allowed to quote separately/independently against this tender. The collaborator is also not allowed to quote separately/independently against this tender. All the bids received in such case will be summarily rejected.

1.9 DOCUMENTS:

Bidders must furnish documentary evidences, in support of fulfilling all the above requirement as under along with the Techno-Commercial Bid:

a) Copies of relevant pages of Contracts & Completion Certificate issued by the clients in support to establish successful execution as per 1.1 & 1.2 must be submitted along with the techno-commercial bid. These documents should be in the form of duly attested copies of contracts/work orders/completion certificates/payment certificates etc. issued by clients.

b) Audited balance sheets and profit and loss accounts for last 3(three) years in equivalent INR or US$ as mentioned in Clause Nos. 1.3 above.

c) MOU or legally acceptable documents (wherever applicable) in support of consortium arrangement (Documents for in Clause Nos. 1.6b, 1.7d).

d) All documents submitted with bid must be self certified by the bidder's authorized person signing the bid. However, OIL reserves the right to ask for any Original document for verification.

e) Bidder while submitting the documents in support of their experience vide Clause Nos. 1.1 & 1.2 above shall also submit details of experience and past performance of the collaborator (in case of collaborator) or of joint venture partner (in case of a joint venture), or Leader of the consortium (in case of Consortium bid) on works/jobs done of similar nature in the past along with the Techno-Commercial Bid. Also, details of current work in hand and other contractual commitments of the bidder (indicating areas and clients) are to be submitted along with documentary experience in the Techno-Commercial Bid in support of the experience laid down in Clause Nos. 1.1 & 1.2 above.

NOTES:

Required Certificates/Confirmation document as indicated above should be submitted along with the un-priced Techno-Commercial bid; absence of which will render the offers Non responsive.

1.10 OIL shall be entering into an Integrity Pact with the bidders as per format enclosed vide PROFORMA-III of the tender document. Each page of this Integrity Pact Proforma has been duly signed by OIL's competent signatory. The Proforma has to be returned by the bidder duly signed (alongwith Technical Bid) by the same signatory who signed the bid i.e. who is duly authorized to sign the bid. Any bid, not accompanied by Integrity Pact Proforma duly signed by the bidder shall be rejected straightway. All the pages of the Integrity Pact to be signed by bidders's authorized signatory who sign the bid.

2.0 COMMERCIAL

2.1 Bids are invited from reputed capable Bidders under Single Stage Two Bid System i.e. Technical Bid (Un-priced) and Commercial Bid (Priced) separately. Bidders must submit both "Technical" and "Commercial" Bids in electronic form through online OIL's e-Tender portal accordingly within the Bid Closing Date and time stipulated in the e-Tender. The technical Bid is to be submitted as per Scope of Work & Technical Specifications of the tender in **Technical RFx Response Tab** and the Price Bid as per the Price Bid Format under Notes & attachments Tab. Any offer not complying with the above will be rejected straightway.

2.2 In Technical Bid opening, only the **Technical RFx Response Tab** will be opened. Therefore, the bidder should ensure that Technical Bid is uploaded in the **Technical RFx Response->User->Technical Bid Tab** Page only. No price should be given in above C-folder; otherwise the offer will be rejected. Please go through the help document provided in OIL's e-Portal, in details before uploading the documents.

2.3 Prices/Rates should be maintained in the "Price Bid Format" under Notes & attachments Tab. Bidders should specify the currency in their offer which can either be Indian Rupees or any foreign currency freely convertible.

2.4 Rates quoted in the Price Bid Format in the form of MS-Word sheet uploaded under Notes & attachments Tab in the e-Tender portal shall only prevail.

2.5 Prices and rates quoted by Bidders must be held firm during the term of the contract and not be subject to any variation. Bids with adjustable price terms will be rejected.

2.6 Bid Security in original must reach the office of Chief Manager (M & C), Oil India Limited, Rajasthan Project, 02 A Sarawati Nagar, Jodhpur – 342 005, Rajasthan, India, before the bid opening date and time, otherwise, bid will be rejected. The amount of Bid Security shall be as specified in the "Forwarding Letter". Scanned copy of this Bid Security should also be submitted /uploaded online along with the un-priced (Technical) Bid. Public Sector Undertakings and Firms registered with NSIC/Directorate of Industries in India are exempted from submission of bid security against this tender. Bid security must be valid for minimum 180 days from Scheduled Bid Closing Date. Bids with Bid security not having above minimum validity will be rejected.

2.7 Bids received in physical form, but not uploaded in OIL's e-Tender Portal will be rejected.

2.8 Bidders must quote rates in accordance with the price schedule outlined in PRICE BID FORMAT (PROFORMA-II & III), otherwise the Bid will be rejected. The Bids in which the rates for any part of the work are not quoted shall be rejected. However, if no charge is involved for any of the work/item, 'NIL' should be mentioned against such part of work.

2.9 Bids received by Company after the bid closing date and time will be rejected

2.10 User ID & Password are not transferable. Offers made by bidders who have not been issued /permitted to download the bid document by the Company will be rejected.

2.11 Any bid received in the form of Telex/Cable/Fax/E-Mail will be rejected.

2.12 Bids must be kept valid for a minimum period of 120 days from the date of scheduled bid closing. Bids with inadequate validity will be rejected.

2.13 The Bids and all uploaded documents must be digitally signed using "Class 3" digital certificate [e-commerce application (Certificate with personal verification and Organization name)] as per Indian IT Act obtained from the licensed Certifying Authorities operating under the Root Certifying Authority of India (RCAI), Controller of Certifying Authorities (CCA) of India.

2.14 There must be no exception to the following Clauses including sub-clauses, otherwise the Bid will be rejected:

- Performance Guarantee Bond Clause
- Tax liabilities Clause
- Insurance Clause
- Force Majeure Clause
- Termination Clause
- Arbitration Clause
- Liability Clause
- Applicable Law Clause

3.0 GENERAL:

3.1 The compliance statement (enclosed PROFORMA – I) should be digitally signed and uploaded along with the technical bid (un-priced). In case bidder takes exception to any clause of tender document not covered under BEC/BRC, then the Company has the discretion to load or reject the offer on account of such exception if the bidder does not withdraw/modify the deviation when/as advised by the Company. The loading so done by the Company will be final and binding on the bidders.

3.2 To ascertain the substantial responsiveness of the bids, Company reserves the right to ask the bidder for clarification in respect of clauses covered under BRC also and such clarification fulfilling the BRC clauses in Toto must be received on or before the deadline given by the Company, failing which the offer will be summarily rejected.

3.3 If any of the clauses in the BRC contradicts with other clauses of bidding document elsewhere, then the clauses in the BRC shall prevail.

3.4 Any exception or deviation to the tender requirements must be tabulated in PROFORMA-I of this Section by the Bidder in their Technical Bid only. Any additional information, terms or conditions included in the Commercial (Priced) Bid will not be considered by OIL for evaluation of the Tender.

3.5 The Company reserves the right to cancel/withdraw the tender or annul the bidding process at any time prior to award of contract, without thereby incurring any liability to the bidders or any obligation to inform the bidders of the grounds of Company's action.

B) BID EVALUATION CRITERIA (BEC):

1.0 The bids conforming to the technical specifications, terms and conditions stipulated in the bidding document and considered to be responsive after subjecting to Bid Rejection Criteria will only be considered for further evaluation as per the Bid Evaluation Criteria given below.

1.1 The bids shall be technically evaluated based on the requirements provided in Tender document.

1.2 In the event of computational error between unit price and total price, unit price shall prevail.

1.3 Evaluation of Bids will be as per enclosed Proforma – II & III for arriving at the total estimated cost of the contract. The headings(s) mentioned in Proforma-II are summarized one for which the details are provided in Section-I of the tender document.

NOTE: If any of the clauses in the BEC/BRC contradict with other clauses of bidding document elsewhere, then the clauses in the BEC/BRC shall prevail.

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PROFORMA - I

STATEMENT OF COMPLIANCE

(Only exceptions/deviations to be rendered)

SECTION NO. (PAGE NO.)	CLAUSE NO. SUB-CLAUSE NO.	COMPLIANCE/ NON COMPLIANCE	REMARKS

(Authorised Signatory)

Name of the bidder_____

NOTE : OIL INDIA LIMITED expects the bidders to fully accept the terms and conditions of the bid document. However, should the bidders still envisage some exceptions/ deviations to the terms and conditions of the bid document, the same should be highlighted as per format provided above and to be submitted as part of their Technical Bid. If the proforma is left blank, then it would be presumed that the bidder has not taken any exception/deviation to the terms and conditions of the bid document.

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PROFORMA-II

PRICE BID FORMAT

A. (i) For Foreign Bidder : **Currency Quoted :**

Item No.	Description of Material	Unit	Qty.	Unit Rate (Currency)	Total (Currency)
1	Progressive Cavity Pump along	No.	02		

	with all accessories as per Appendix-A, B & C				
	Total Material Cost of 2 nos. PCP				
	Total Cost of 2 yrs. Spares & Consumables for 2 nos. PCP				
	TOTAL MATERIAL COST				
	Packing & FOB Charges				
	Total FOB Value				
	Ocean Freight Charge to Kolkata Port, India				
	Insurance Charge				
	Total CIF Kolkata Value				
2	Installation & Commissioning charge inclusive of service tax	No.	02		
	Total Installation & Commissioning charge inclusive of service tax for 2 nos. PCP				
	Total CIF Kolkata including I/C charge				

(ii) For Indian Bidder : **Currency Quoted :**

Item No.	Description of Material	Unit	Qty.	Unit Rate (Currency)	Total (Currency)
1	Progressive Cavity Pump along with all accessories as per Appendix-A, B & C	No.	02		
	Total Material Cost of 2 nos. PCP				
	Total Cost of 2 yrs. Spares & Consumables for 2 nos. PCP				
	TOTAL MATERIAL COST				
	Packing /Forwarding Charge				
	Excise Duty(Exempted under Deemed Export)				
	Sales Tax				
	Total FOR Despatching Station Value				
	Freight Charge to Hamira, Jaisalmer				
	Insurance				
	Total FOR Destination Value				
2	Installation & Commissioning charge inclusive of service tax	No.	02		
	Total Installation & Commissioning charge inclusive of service tax for 2 nos. PCP				
	Total FOR Destination Value including I/C charge				
3	Import Content				

B. List of Recommended Spare Parts / Consumable for 2 years for smooth operation of 2 nos. PCP with quantity and unit rate:

Item No.	Part Number	Detailed Item Description	First Year				Second Year				Remarks
			Qty	UOM	Unit Rate (Currency)	Total (Currency)	Qty	UOM	Unit Rate (Currency)	Total (Currency)	

Total Material Cost of 2 yrs. Spares & Consumable for 2 nos. PCP :

C. Bidder shall have to furnish the unit rate of various components of the PCP as listed in Appendix – D.

OTHER TERMS & REQUIREMENTS:

1. In the event of finalization of the contract, whenever any foreign national is engaged for the job, the Visa as well as other statutory permits required for visit of such personnel to site shall be arranged by the bidder at their cost and effort. Necessary invitation letter/certification will be issued by OIL on request.

2.0 The work site, i.e., Baghewala oil field is located close to international border in the western part of India. As such, for visit by foreign national, a special permit from Ministry of Home Affairs will be required to be obtained by expatriates visiting the locations. Necessary assistance to this effect will be extended by OIL.

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PROFORMA-III

PRICE SCHEDULE FOR COMMERCIAL EVALUATION OF BID

1.0 To ascertain the inter-se-ranking, the comparison of the responsive bids will be made as under, subject to corrections / adjustments given herein.

1.1 When only **foreign bidders** are involved:

Comparison of bids will be done on the basis of "TOTAL VALUE" which is estimated as under:
(A) Total material cost of 2 nos. PCP

(B) Total cost of 2 years Spares & Consumables for 2 nos. PCP
(C) TOTAL MATERIAL COST (A+B)
(D) Total Packing & FOB Charges for PCP & 2 yrs. spares
(E) Total FOB Port of Shipment value, (C+D) above
(F) Ocean Freight Charges upto Kolkata, India
(G) Insurance Charges @ 1% of Total FOB Value vide (E) above
(H) Banking Charges @ 0.5% of Total FOB Value vide (E) above in case of payment through Letter of Credit (If confirmed L/C at buyer's account is required, 1.5% of Total FOB Value will be loaded)
(I) Total CIF Kolkata Value, (E+F+G+H) above
(J) Total Installation & Commissioning charges for 2 nos. PCP including service tax
(K) Total Value, (I+J) above

NOTE: Banking charge in the country of the foreign bidder shall be borne by the bidder.

1.2 When only domestic bidders are involved or when more than one **domestic bidders** are in contention in case of mixed response:

Comparison of bids will be done on the basis of "TOTAL VALUE" which is estimated as under:

(A) Total material cost of 2 nos. PCP
(B) Total cost of 2 years Spares & Consumables for 2 nos. PCP
(C) TOTAL MATERIAL COST (A+B)
(D) Total Packing & Forwarding Charges for PCP & 2yrs. spares
(E) Total Ex-works value, (C+D) above
(F) Excise Duty including Cess, (Please indicate applicable rate of Duty & Cess)
(G) Sales Tax, (Please indicate applicable rate of Tax)
(H) Total FOR Despatching station price, (E+F+G) above
(I) Road Transportation charges to Hamira, Jaisalmer
(J) Insurance Charges @0.5% of Total FOR Despatching Station Value (H) above
(K) Total FOR Hamira, Jaisalmer value, (H+I+J)
(L) Rajasthan Entry tax
(M) Total Installation & Commissioning charges for 2 nos. PCP including service tax
(O) Total Value, (K+L+M) above

NOTE: Excise Duty in case of the indigenous bidder is EXEMPTED under Deemed Export.

1.3 When **both foreign** and **domestic bidders** are involved:

The Total Value of domestic bidder (inclusive of customs duty on imported raw material and components etc. and applicable terminal excise duty on the finished products and Sales Tax) excluding inland transportation to destination, Rajasthan Entry Tax and Insurance charges worked out as per Para 1.2 above and Total Value of the foreign bidder worked out as per Para 1.1 above will be compared. No price preference will be allowed to indigenous bidders except that for capital goods, the domestic manufacturers would be accorded a price preference to offset CST to the extent of 4 % or actuals, whichever is less subject to 30 % local content norms as stipulated for World Bank Funded project to the satisfaction of OIL. When more than one domestic bidders fall within price preference range, inter-se-ranking will be done on Total Value basis.

Note: If the Government of India revises these evaluation criteria the same as applicable

on the bid closing date will be adopted for evaluation of the offers.

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

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1. APPENDIX A : ELECTRIC-MOTOR FUNCTIONAL SPECIFICATION

Item	GOODS Description	COMPANY'S Minimum Requirement	CONTRACTOR's Data
A	**Estimated Environmental Conditions**		
A.01	Anticipated Temperature (Max./Min.): deg C	**50 / -1**	
A.02	Relative Humidity (Max.): %	**40**	
A.03	Wind Velocity (Max.) KM/Hr	**128**	
B	**Electric-Motor**		
B.01	Electric-Motor driven by VSD:	Flameproof/ Non-sparking Motor DGMS Approved	
B.02	Electric-Motor Hazardous Area Protection:	Ex d/Ex n II T3, DGMS Approved	

B.03	Electric-Motor Power : HP	Contractor to specify in compliance with PCP	
B.04	Electric-Motor Nominal Power Supply Voltage : Volts	415 (+/- 10%)	
B.05	Electric-Motor Nominal Power Supply Frequency: Hz	50	
B.06	Electric-Motor Phases: Nr	3	
B.07	Electric-Motor Poles: Nr	Contractor to specify speed (asynchronous speed)	
B.08	Electric-Motor nom. Electric Power at full load: Amps	Contractor to specify	
B.09	Electric-Motor nominal Speed: rpm	Contractor to specify	
B.10	Electric-Motor nom. Torque: Nm	Contractor to specify	
B.11	Electric-Motor Classification: 'Totally Enclosed, Fan Cooled' (TEFC)	TEFC	
B.12	Electric-Motor Enclosure:	IP 55 (or better)	
B.13	Electric-Motor Frame Size:	Contractor to specify	
B.14	Electric-Motor Case Material:	Contractor to specify	
B.15	Electric-Motor Usage:	Continuous (driven by AFE/Regenerative VSD)	
B.16	Electric-Motor Current value measured with blocked Rotor: Amps	Contractor to specify	
B.17	Electric-Motor Torque value measured with blocked Rotor: Nm	Contractor to specify	
B.18	Electric-Motor Service Factor (SF):	1.15	
B.19	Electric-Motor Power Factor:	0.85 or better	
B.20	Electric-Motor Efficiency Factor: %	Minimum IE 2	

Item	**GOODS Description**	**COMPANY'S Minimum Requirement**	**CONTRACTOR's Data**
B.21	Electric-Motor Driven by:	AFE/Regenerative VSD	
B.22	Electric-Motor Junction Box (Terminal Box):	IP 55 or better	
B.23	Electric-Motor Insulation Class: NEMA	F	
B.24	Electric-Motor Estimated Weight: lbs	Contractor to specify	
B.25	Electric-Motor Noise Level: dB	85 or less at 1 m	
B.26	Electric-Motor Temperature Code :	T3	
B.27	Electric-Motor Tests:	According with IEC standards	
B.28	Electric-Motor Stator:	Made of silicon steel sheet thermo chemically treated to improve the electrical characteristics, electrical losses reduction and working temperature	
B.29	Electric-Motor Bearing:	CONTRACTOR to specify	
B.30	Electric-Motor Paint:	CONTRACTOR to specify	
	Quantity (each)	**1**	

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APPENDIX B : VSDFUNCTIONAL SPECIFICATION

Item	GOODS Description	COMPANY'S Minimum Requirement	CONTRACTOR's Data
A	**Estimated Environmental Conditions**		
A.02	Anticipated Temperature (Max./Min.): deg C	**50 / -1**	
A.03	Relative Humidity (Max.): %	**40**	
A.04	Wind Velocity (Max.) KM/Hr	**128**	
B	**Variable-Speed-Drive - INPUT VARIABLES**		
B.01	VSD Input Voltage: Volts	415 (+/- 10%)	
B.02	VSD Phases: Nr	3	
B.03	VSD Power Supply Frequency: Hz	50	
B.04	VSD Power: HP	Contractor to specify in compliance with PCP and Electric motor	
B.05	VSD Power Factor:	CONTRACTOR to specify	
B.06	**VSD Total-Harmonic-Distortion (THD): %**	**< 5**	
B.07	VSD Phase to Phase Tension Misbalance:	CONTRACTOR to specify	

C	**Variable-Speed-Drive - OUTPUT VARIABLES**		
C.01	VSD nominal Voltage: Volts	CONTRACTOR to specify	
C.02	VSD Phases: Nr	3	
C.03	VSD Frequency Range: Hz	0 to 300	
C.04	VSD Continuous Operations: %	100	
C.05	VSD Overload in excess of 110%:	For 30 (thirty) minutes and short circuit current	
D	**Variable-Speed-Drive - CONTROL**		
D.01	VSD Number of Pulses: Type	Regenerative/'Active-Front-End'	
D.02	VSD Control Method: Type	Direct Torque Control	
D.03	VSD Active Rectifier Unit: Type	IGBT	
D.04	VSD Frequency Range: Hz	0 to 300	
D.05	VSD Start-Up Frequency: Hz	0 to 20	
D.06	VSD Acceleration/Deceleration Time: Sec	0 to 1,800	
D.07	VSD Speed Control Precision: %	+/- 0.1	
D.08	In the event of loss of Power Supply the VSD shall be capable maintain the 75% output Power Supply to the Electric-Motor for xx Sec.:	1	
D.09	VSD Automatic Start:	Programmable	
D.10	VSD Torque Limit:	CONTRACTOR to specify	
D.11	VSD Current Limit: Amps	CONTRACTOR to specify	
Item	**GOODS Description**	**COMPANY'S Minimum Requirement**	**CONTRACTOR's Data**
D.12	VSD IP21 Cabinet Cooling:	Forced Air with Filter and failure alarm	
D.13	VSD Speed Adjustment:	0 to nominal speed	
D.14	VSD Efficiency: %	≥ 0.98 at rated load	
D.15	VSD PCP Application Software:	Required	
E	**Variable-Speed-Drive - PROTECTION CAPABILITIES**		
E.01	VSD Over Load:	Required	
E.02	VSD Over Current:	Required	
E.03	VSD Over Voltage:	Required	
E.04	VSD Low Voltage:	Required	
E.05	VSD Over Heating:	Required	
E.06	VSD Ground Fault:	Required	
E.07	VSD Phase Inversion:	Required	
E.08	VSD EM Phase loss:	Required	
E.09	VSD Output Over Frequency:	Required	
E.10	VSD Loss of I/O Signals:	Required	
E.11	Short Circuit among Phases:	Required	
E.12	VSD Input Circuit Breaker:	Required	
E.13	VSD Internal Fuses:	CONTRACTOR to specify	

E.14	VSD Ground Connection: Q,ty	Minimum 2 (two)	
F	**Variable-Speed-Drive - USER-INTERFACE-PAD**		
F.01	Communication Ports:	Ethernet, RS-485 and USB Ports with Configurable Parameters	
F.02	Protocol:	Required	
F.03	Remote Monitoring and Start-Up:	Required	
F.04	Remote Start-Up and re-Start-Up:	Required	
F.05	Remote Speed Variation:	Required	
F.06	Remote Unauthorized Personnel Intrusion Alarm:	Alarm for door opening	
G	**Variable-Speed-Drive**		
G.01	VSD Cabinet:	IP55	
G.02	VSD Cabinet Ventilation:	Forced Air with Filter	
G.03	VSD Harmonics Active Filter 'LCL':	Required	
G.04	VSD Cabinet Frontal Light Indicators:	Required	
G.05	VSD Cabinet Frontal Controls:	Required	
G.06	VSD Cabinet Frontal Door/Panel Lockable:	Not Required (Power House Installation)	
Item	**GOODS Description**	**COMPANY'S Minimum Requirement**	**CONTRACTOR's Data**
G.07	VSD Cabinet Interior Fluorescent lamp Lighting with a door open/closed Switch:	Not Required (Power House Installation)	
G.08	VSD Cabinet Frontal Controls:	Required	
G.09	VSD Cabling: NEMA	According with NEMA 3B standard	
G.10	VSD Cabinet Power Supply Cable Entry from the EM:	From Bottom	
G.11	VSD Cabinet Power Supply Cable Entry from the External Power Supply Grid:	From Top	
G.12	VSD Transient Suppressor Arrestor:	Required	
G.13	VSD Cabinet Power Supply Cable Entry from the External Power Supply Grid:	From Top	
G.14	VSD Cabinet Heater:	Required	
G.15	VSD Cabinet Heater Thermostat:	Required	
G.16	VSD Cabinet free Standing:	Required	
G.17	VSD Main Circuit Breaker (110 Volts):	Required	
G.18	VSD Fuses Box with ultrafast 400 Amps Fuses:	Required	
G	**Variable-Speed-Drive (ET) - IP21 CABINET**		
G.19	Electric-Motor Over Load Protection (one for each Electric-Motor):	Thermistor measurement relay for each Electric-Motor	
G.20	Control Power Transformer 480/220/110 Volts, 1,000 VA with Input/Output Protection by Circuit Breaker:	Required	

G.21	Control Power Transformer 480/220/110 Volts, 500 VA with Input/Output Protection by Circuit Breaker:	Required	
G.22	24 Volts, 5 Amps Power Supply:	Required	
G.23	Emergency Unit Shutdown Red Color Push Button located on the Cabinet Front Door:	Required	
G.24	Power Supply Cables Terminals for 480 Volts, Size 500 kcmil Cable (from external Power Grid) and Size 2 AWG Output Power Supply Cables:	Required	
G.25	Control Panel provided with fuses holders for Analog and Digital signals:	Required	
G.26	Modbus-RTU and RS-485 Ports:	Required	
G.27	Auxiliary Power Socket 110 Volts with Circuit Breaker Protection:	Required	
G.28	Grounding Terminals blocks for Cable Size 2 AWG:	Required	
G.29	Terminals Blocks shall be properly labeled:	Required	
G.30	Folding Table located on Cabinet Door for Laptop Computer:	Not Required	
G.31	Drawings Pocket located on Cabinet Door:	Required	
Item	**GOODS Description**	**COMPANY'S Minimum Requirement**	**CONTRACTOR's Data**
G.32	Stainless Steel VSD Identification Plate with the following nameplate data as a minimum :	Manufacturer, Manufacturing Date, Standard, Type, Serial Number, Frequency, Power Rating (HP), Phases Number, Voltage Rating, Current Rating, Class,	
	Quantity (set)	**1**	
H	**Electric-Motor to VSD Power Supply Cable – VSD Compliant Power Cable**		
H.01	3 (three) Soft annealed Stranded tin copper Cores Size 2 AWG (35 mm^2), with 3 (three) Soft annealed tranded tin Copper Core Size 10 AWG Grounding Conductors, XLP (Cross-Linked Polyethylene) Jacket, -40°C to 90°C; Ampacity resistant: 152 A in free Air; 130 A in Cable Tray; 119 A in Conduit:		
	Quantity (m)	100	

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APPENDIX C : PCP, DRIVE HEAD, DOWN HOLE SENSOR, DATA LOGGER FUNCTIONALSPECIFICATION

Item	GOODS Description	COMPANY'S Minimum Requirement	CONTRACTOR's Data
A	**Progressive Cavity Pump**		
A.01	PCP Stator with compatible High Nitrile rubber element for 50 to 100 BBL/Day (Contractor shall design the PCP based on the reservoir and fluid rheology data provided along with the bid document and quote accordingly.)	50-100 bbl/day (Elastomer shall be specified by Contractor based on Elastomeric compatibility test. OIL shall provide required crude oil sample for the test)	
A.02	Rotor	With end connection of 7/8"	
A.03	Tag Bar Nipple with EUE connection and N 80 Metallurgy.	Required	
A.04	Drain Nipple with EUE connection and N 80 Metallurgy.	Required	
A.05	Seating Nipple with EUE connection and N 80 Metallurgy	Required	
A.06	Torque Anchor	Suitable for 9.5/8" 43.5 ppf production casing	
	Quantity (set)	1	
B	**Drive head**		
B.01	Shaft type	Hollow	
B.02	Polish Rod torque (Ft-Lbs)	2850	
B.03	Thrust Bearing-ISO Rating (lbs)	50000	
B.04	Polish Rod Speed (rpm)	Contractor to specify	
B.05	Maximun Operating Temperature (°C)	55^0C	

B.06	Polish Rod Size (in)	1.5”	
B.07	Structure type	Contractor to specify	
B.08	Back-spin Control	Hydraulic Gear Pump	
B.09	Wellhead Connection	3 1/8" x 5000 psi	
B.10	Driven Sheave Max. Diameter (in)	Contractor to specify	
B.11	Drive Sheave Max. Diameter (in)	Contractor to specify	
B.12	Drive Belt Type	Synchro Belts / 4GR or 5GR/5V	
B.13	Maximum no. of Belt	Contractor to specify	
B.14	Housing rated pressure (for Stuffing Box)	3000 psi	
B.15	Stuffing Box Seal pressure static (psi)	1500 psi	
B.16	Type of Stuffing Box	Conventional	
B.17	Protection Type	IP 55	
	Quantity (set)	**1**	
	GOODS Description	**COMPANY’S Minimum Requirement**	**CONTRACTOR’s Data**
C	Flow Tee		
C.01	**Flow TEE**	3 1/8" x 5000 psi Flange type top and bottom connection with 2” NPT Side connection	
	Quantity (No.)	1	
D	**Down hole sensor**		
D.01	Measuring Variable	(i) Pump intake Pressure (0- 1500 psi, Precision +/- Range 0.1%) and Temperature (0- 2500F, Precision +/- Range 0.1%) (ii) Pump discharge Pressure (500-4500 psi, Precision +/- Range 0.1%) and Temperature (0-300 F, Precision +/- Range 0.1%) (iii) Vibration (0-12, Precision +/- Range 0.05%)	
D.02	Material	Body and diaphragm Hastalloy C276, Housing and adapters Inconel 925, 825/SS 316	
D.03	TEC line cable	The instrument line shall be ¼” nom. OD x 0.049” wall thickness, material grade: AISI 316L, encapsulated (encapsulation material to be ETFE). Qty.:4000 ft	
D.04	Clamps 2.87 "	Cross Coupling Protector Clamp for the 2.87 " EUE Tubing connection, with two slots to house the 3/8” nom.OD Diluents injection line and 1/4" TEC line (Item 3). Qty.: 150 Nos.	

D.05	Exit Bushing	Material 316 Stainless Steel. The connectors of TEC line at the Well head shall fit to 0.5 ” NPT, 5000 psi Working Pressure	
D.06	Lighting Protection Juction Box	Box 3 "x 6" x2, 38 ". 2 connections 1 / 2" NPT 30V arrestor.	
	Gauge Carrier Mandrel with 1" Pocket (or compitable with Pressure and Temperature Gauge)	2.87" nom. OD 6.5 ppf EUE connection Box x Pin N 80	
	Quantity (set)	1	
E	**Data Logger**		
E.01	Enclosure	Metal Nema 4X(Class 1, Div II)/IP 66	
E.02	Energy consumption	6 Watts	
E.04	Communication conection	RS-2332 Y RS-485	
Item	**GOODS Description**	**COMPANY’S Minimum Requirement**	**CONTRACTOR’s Data**
E.05	Microprocessor	Must comply with the software offered. With internal timer, Real time clock	
E.06	Memory	32 MB, Flash EEPROM	
E.07	Environmental	Operation Temperature:0 °C to +55 °C/32 °F to 131 °F	
E.08	Communication channel	CAN Duel	
E.09	Control PID	12 function blocks for PID controllers	
E.10	Variables Hub	Variables obtaining up to 12 slave devices	
E.11	Flow totaliser	10 function blocks flow totalizer	
E.12	Analog output	8 x 4-20mA	
E.13	Analog input	8 x 4-20mA	
E.14	Panel failure indicator	Remote and local indication (Led indicator)	
E.15	Power supply	9 - 36 W or 90 - 240 W	
E.16	Local indicator type LCD	Four (4) lines X Twenty (20) digits, alphanumeric, with indication of the different process variables in Engineering unit	
E.17	Rdaio RF	MDS 9710A	
E.18	Down hole sensor Interface	Mpod2, Mpod2+ , Mpod 3	
E.19	Production Protocols	Modbus TCP/IP	
		Telnet	
		PPP	
		FTP	

		HTTP	
		Modbus RTU	
	Quantity (set)	1	
F	**Sucker Rods**		
F.01	Sucker Rods	1 ” x 25 ft. long x 7/8” API Pin with Coupling (Material : AISI A-4330-M , High strength Coupling)	
	Quantity (Nos.)	180	

Item	**GOODS Description**	**COMPANY’S Minimum Requirement**	**CONTRACTOR’s Data**
G.02	Pony Rods	1 ” x 1 ft. long x 7/8” API Pin with Coupling (Material : AISI A-4330-M , High strength Coupling)	
		1 ” x 2 ft. long x 7/8” API Pin with Coupling (Material : AISI A-4330-M , High strength Coupling)	
		1 ” x 4 ft. long x 7/8” API Pin with Coupling (Material : AISI A-4330-M , High strength Coupling)	
		1 ” x 6 ft. long x 7/8” API Pin with Coupling (Material : AISI A-4330-M , High strength Coupling)	

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APPENDIX-D

UNIT PRICE OF VARIOUS COMPONENTS OF PCP

Item No.	Description of Material	Unit	Unit Rate
1	Drive Head	No.	
2	Flow TEE	No.	
3	Stator and Rotor	No.	
4	Tag Bar Nipple	No.	
5	Drain Valve	No.	
6	Torque Anchor	No.	
7	Seating nipple	No	
8	Down hole Pressure and Temperature gauge (i.e. single gauge housed in a dedicated Gauge Carrier located above the PC-Pump).	No.	
9	Down hole Gauge carrier mandrel	No.	
10	Armored Instrument Cable (TEC Line)	Feet	
	Splice Kit	No.	
	Exit Bushing	No.	
	Junction Box		
11	Cross Coupling Protector Clamps	No.	
12	Surface Data Logger c/w all relevant connections.	No.	
13	Any additional Equipment/Component (BIDDER to specify).		
14	1 ” x 25 ft. long x 7/8” API Pin with High strength (HS) Coupling	No.	
15	Polish Rod 1.5 " OD pin 7/8", CHROME PLATED	No.	
16	1 ” x 1 ft. long x 7/8” API Pin with HS Coupling	No.	
17	1 ” x 1 ft. long x 7/8” API Pin with HS Coupling	No.	
18	1 ” x 2 ft. long x 7/8” API Pin with HS Coupling	No.	
19	1 ” x 4 ft. long x 7/8” API Pin with HS Coupling	No.	

20	1 ” x 6 ft. long x 7/8” API Pin with HS Coupling	No.	
21	1 ” x 8 ft. long x 7/8” API Pin with HS Coupling	No.	
22	1 ” x 10 ft. long x 7/8” API Pin with HS Coupling	No.	
23	Electric Motor	No.	
24	Variable Speed Drive	No.	
25	Electric-Motor to VSD Power Supply Cable	feet	
26	Elastomer Compound Compatibility Test		

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