

BUYERS SPECIFIC ADDITIONAL TERMS & CONDITIONS**ITEM NAME: Oil Purification Unit along with spares**

PROJECTS- Mahan Unit-1 (PH-2), Raigarh Unit-1 & 2 (PH-2) , Raipur Unit-1 & 2 (Ph-2), Mirzapur Unit-1 & 2 (PH-1), Kawai Unit-1 & 2 (PH -II), Kawai Unit-1 & 2 (Ph-III) & Mahan Unit-1 & 2 (PH-III)

1. SCOPE OF ENQUIRY:

ITEM-NO	MATERIAL CODE & ITEM DESCRIPTION	Project	DATE FOR SUPPLY COMPLETION	Total QTY. for each material Code	No. of Units Covered for each material Code	Qty Unit wise
1	W99311928186 BEARINGS OF CENTRIFUGE & FEED PUMP ONLY SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Spare Item	07-07-2026	12 Set	6	2 Set
		Raipur Unit-1 (Ph-2) Spare Item	30-05-2027			2 Set
		Mirzapur Unit-1 (PH-1) Spare Item	30-11-2027			2 Set
		Kawai Unit- 1 (PH -II) Spare Item	30-05-2028			2 Set
		Kawai Unit-1 (Ph-III) Spare Item	30-08-2028			2 Set
		Mahan Unit-1 (PH-III) Spare Item	30-06-2028			2 Set
2	W99311928216 CARTRIDGE FILTETRS OF OIL PURIFICATION SYSTEM SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Spare Item	07-07-2026	12 Set	6	2 Set
		Raipur Unit-1 (Ph-2) Spare Item	30-05-2027			2 Set
		Mirzapur Unit-1 (PH-1) Spare Item	30-11-2027			2 Set
		Kawai Unit- 1 (PH -II) Spare Item	30-05-2028			2 Set
		Kawai Unit-1 (Ph-III) Spare Item	30-08-2028			2 Set
		Mahan Unit-1 (PH-III) Spare Item	30-06-2028			2 Set
3	W90318103427 SEPERATOR MOTOR FOR LUB OIL PURIFIER AS PER ST39013 SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Spare Item	07-07-2026	5 No.	5	1 No.
		Raipur Unit-1 (Ph-2) Spare Item	30-05-2027			1 No.
		Mirzapur Unit-1 (PH-1) Spare Item	30-11-2027			1 No.
		Kawai Unit- 1 (PH -II) Spare Item	30-05-2028			1 No.
		Kawai Unit-1 (Ph-III) Spare Item	30-08-2028			1 No.
4	W90318103435 BEARING FOR SEPERATOR MOTOR 1 SET ND AND DE SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Spare Item	07-07-2026	5 No.	5	1 No.
		Raipur Unit-1 (Ph-2) Spare Item	30-05-2027			1 No.
		Mirzapur Unit-1 (PH-1) Spare Item	30-11-2027			1 No.
		Kawai Unit- 1 (PH -II) Spare Item	30-05-2028			1 No.
		Kawai Unit-1 (Ph-III) Spare Item	30-08-2028			1 No.
5	W90318103168 RTDS FOR OIL PURIFICATION UNIT:1 NO. EACH TYPE AND RANGE SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Spare Item	07-07-2026	12 No.	6	2 No.
		Raipur Unit-1 (Ph-2) Spare Item	30-05-2027			2 No.
		Mirzapur Unit-1 (PH-1) Spare Item	30-11-2027			2 No.
		Kawai Unit- 1 (PH -II) Spare Item	30-05-2028			2 No.
		Kawai Unit-1 (Ph-III) Spare Item	30-08-2028			2 No.
		Mahan Unit-1 (PH-III) Spare Item	30-06-2028			2 No.
6	W90318103150 PRESSURE SWITCH FOR OIL PURIFICATION UNIT:1 NO. EACH TYPE AND RANGE SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Spare Item	07-07-2026	6 No.	6	1 No.
		Raipur Unit-1 (Ph-2) Spare Item	30-05-2027			1 No.
		Mirzapur Unit-1 (PH-1) Spare Item	30-11-2027			1 No.
		Kawai Unit- 1 (PH -II) Spare Item	30-05-2028			1 No.
		Kawai Unit-1 (Ph-III) Spare Item	30-08-2028			1 No.
		Mahan Unit-1 (PH-III) Spare Item	30-06-2028			1 No.
7	W90318103265 MANDATORY SPARE FOR DPS ACROSS POLISHING FILTER OF OIL PURIFIER UNIT,ST39013 SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Spare Item	07-07-2026	6 No.	6	1 No.
		Raipur Unit-1 (Ph-2) Spare Item	30-05-2027			1 No.
		Mirzapur Unit-1 (PH-1) Spare Item	30-11-2027			1 No.
		Kawai Unit- 1 (PH -II) Spare Item	30-05-2028			1 No.
		Kawai Unit-1 (Ph-III) Spare Item	30-08-2028			1 No.
		Mahan Unit-1 (PH-III) Spare Item	30-06-2028			1 No.
8	W90318103192 LEVEL SWITCH FOR OIL PURIFICATION UNIT: 1 NO. OF EACH TYPE AND	Raigarh Unit-1 (Ph-II) Spare Item	07-07-2026	6 No.	6	1 No.
		Raipur Unit-1 (Ph-2) Spare Item	30-05-2027			1 No.
		Mirzapur Unit-1 (PH-1) Spare Item	30-11-2027			1 No.
		Kawai Unit- 1 (PH -II) Spare Item	30-05-2028			1 No.

	RANGE SPEC: ST39013 REV: 08	Kawai Unit-1 (Ph-III) Spare Item	30-08-2028			1 No.
		Mahan Unit-1 (PH-III) Spare Item	30-06-2028			1 No.
9	W90318103290 MANDATORY SPARES FOR FLOW SWITCH OF OIL PURIFIER UNIT, ST-39013 SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Spare Item	07-07-2026	6 No.	6	1 No.
		Raipur Unit-1 (Ph-2) Spare Item	30-05-2027			1 No.
		Mirzapur Unit-1 (PH-1) Spare Item	30-11-2027			1 No.
		Kawai Unit- 1 (PH -II) Spare Item	30-05-2028			1 No.
		Kawai Unit-1 (Ph-III) Spare Item	30-08-2028			1 No.
		Mahan Unit-1 (PH-III) Spare Item	30-06-2028			1 No.
10	W90318103176 PRESSURE INDICATORS FOR OIL PURIFICATION UNIT:1 NO. EACH TYPE AND RANGE SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Spare Item	07-07-2026	6 No.	6	1 No.
		Raipur Unit-1 (Ph-2) Spare Item	30-05-2027			1 No.
		Mirzapur Unit-1 (PH-1) Spare Item	30-11-2027			1 No.
		Kawai Unit- 1 (PH -II) Spare Item	30-05-2028			1 No.
		Kawai Unit-1 (Ph-III) Spare Item	30-08-2028			1 No.
		Mahan Unit-1 (PH-III) Spare Item	30-06-2028			1 No.
11	W90318103184 TEMP INDICATOR FOR OIL PURIFICATION UNIT: 1 NO OF EACH TYPE AND RANGE SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Spare Item	07-07-2026	6 No.	6	1 No.
		Raipur Unit-1 (Ph-2) Spare Item	30-05-2027			1 No.
		Mirzapur Unit-1 (PH-1) Spare Item	30-11-2027			1 No.
		Kawai Unit- 1 (PH -II) Spare Item	30-05-2028			1 No.
		Kawai Unit-1 (Ph-III) Spare Item	30-08-2028			1 No.
		Mahan Unit-1 (PH-III) Spare Item	30-06-2028			1 No.
12	W90318103613 DRG: 418101H3008 REV:00 OPU CONTROL PANEL SPARE SPEC: ST39013 REV: 08	Mahan Unit-1 (PH-II) Spare Item	07-11-2025	7 Set	7	1 Set
		Raigarh Unit-1 (Ph-II) Spare Item	07-07-2026			1 Set
		Raipur Unit-1 (Ph-2) Spare Item	30-05-2027			1 Set
		Mirzapur Unit-1 (PH-1) Spare Item	30-11-2027			1 Set
		Kawai Unit- 1 (PH -II) Spare Item	30-05-2028			1 Set
		Kawai Unit-1 (Ph-III) Spare Item	30-08-2028			1 Set
		Mahan Unit-1 (PH-III) Spare Item	30-06-2028			1 Set
13	W90311928846 DRG: 411928J8100 REV:00 UNIT OIL PURIFICATION SYSTEM SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Main Item	07-01-2026	12 No.	12	1 No.
		Raigarh Unit-2 (Ph-II) Main Item	07-05-2026			1 No.
		Raipur Unit-1 (Ph-2) Main Item	30-09-2026			1 No.
		Raipur Unit-2 (Ph-2) Main Item	30-03-2027			1 No.
		Mirzapur Unit-1 (PH-1) Main Item	31-03-2027			1 No.
		Mirzapur Unit-2 (PH-1) Main Item	01-10-2027			1 No.
		Kawai Unit- 1 (PH -II) Main Item	30-09-2027			1 No.
		Kawai Unit- 2 (PH -II) Main Item	30-03-2028			1 No.
		Kawai Unit-1 (Ph-III) Main Item	31-12-2027			1 No.
		Kawai Unit-2 (Ph-III) Main Item	30-06-2028			1 No.
		Mahan Unit-1 (PH-III) Main Item	31-10-2027			1 No.
		Mahan Unit-2 (PH-III) Main Item	30-04-2028			1 No.
14	W90311928854 DRG: 411928J8100 REV:00 OIL PURIFICATION SYSTEM (CENTRAL) SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Main Item	07-01-2026	6 No.	6	1 No.
		Raipur Unit-1 (Ph-2) Main Item	30-09-2026			1 No.
		Mirzapur Unit-1 (PH-1) Main Item	31-03-2027			1 No.
		Kawai Unit- 1 (PH -II) Main Item	30-09-2027			1 No.
		Kawai Unit-1 (Ph-III) Main Item	31-12-2027			1 No.
		Mahan Unit-1 (PH-III) Main Item	31-10-2027			1 No.
15	W90311928862DRG: NILL REV:00GASKETS OF ALL SIZES & 'O'RINGS OF ALL SIZES FOR OILPURIFICATION SYSTEMSPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Spare Item	07-01-2026	12 Set	6	2 Set
		Raipur Unit-1 (Ph-2) Spare Item	30-09-2026			2 Set
		Mirzapur Unit-1 (PH-1) Spare Item	31-03-2027			2 Set
		Kawai Unit- 1 (PH -II) Spare Item	30-09-2027			2 Set
		Kawai Unit-1 (Ph-III) Spare Item	31-12-2027			2 Set
		Mahan Unit-1 (PH-III) Spare Item	31-10-2027			2 Set
16	SUPERVISION DURING ERECTION AND COMMISSIONING REQUIRED OF OIL PURIFICATION UNIT AGAINST W90311928846 DRG: 411928J8100 REV:00 UNIT OIL PURIFICATION SYSTEM SPEC: ST39013 REV: 08	Raigarh Unit-1 (Ph-II) Main Item	07-05-2026	12 No.	12	1 No.
		Raigarh Unit-2 (Ph-II) Main Item	07-09-2026			1 No.
		Raipur Unit-1 (Ph-2) Main Item	30-01-2027			1 No.
		Raipur Unit-2 (Ph-2) Main Item	30-07-2027			1 No.
		Mirzapur Unit-1 (PH-1) Main Item	31-07-2027			1 No.
		Mirzapur Unit-2 (PH-1) Main Item	01-06-2028			1 No.
		Kawai Unit- 1 (PH -II) Main Item	30-01-2028			1 No.
		Kawai Unit- 2 (PH -II) Main Item	30-07-2028			1 No.
		Kawai Unit-1 (Ph-III) Main Item	31-04-2028			1 No.
		Kawai Unit-2 (Ph-III) Main Item	30-10-2028			1 No.

SUPERVISION DURING ERECTION AND COMMISSIONING REQUIRED OF OIL PURIFICATION UNIT AGAINST W90311928854 DRG: 411928J8100 REV:00 OIL PURIFICATION SYSTEM (CENTRAL) SPEC: ST39013 REV: 08	Mahan Unit-1 (PH-III) Main Item	31-02-2028	6 No.	6	1 No.
	Mahan Unit-2 (PH-III) Main Item	30-08-2028			1 No.
	Raigarh Unit-1 (Ph-II) Main Item	07-05-2026			1 No.
	Raipur Unit-1 (Ph-2) Main Item	30-01-2027			1 No.
	Mirzapur Unit-1 (PH-1) Main Item	31-07-2027			1 No.
	Kawai Unit- 1 (PH -II) Main Item	30-01-2028			1 No.
	Kawai Unit-1 (Ph-III) Main Item	31-04-2028			1 No.
	Mahan Unit-1 (PH-III) Main Item	31-02-2028			1 No.

2. Project Detail with consignee address:

[A] Project Name	2X800 MW Mahan TPP (PH-II)
Consignee Address	Mahan Energen Limited 2x800 MW (Phase-III) Mahan Ultra Supercritical Thermal Power Project,
[B] Project Name	2X800 MW RAIGARH TPP (PH-II) PROJECT
Consignee Address	Adani Power Limited Village: Chhote Bhandar PO: Bade Bhandar Tehsil: Pussore Raigarh 496100
[C] Project Name	2X800 MW APL Raipur (Ph-II)
Consignee Address	Adani Power Limited Village: Raikheda Block: Tilda, Raipur 493225 Chhattisgarh
[D] Project Name	2X800 MW Mirzapur PH-I
Consignee Address	Mirzapur Thermal Energy (UP) Private Limited Village: Dadri Khurd; PO: Darhi Ram Tehsil: Sadar, District: Mirzapur 231 304 Uttar Pradesh
[E] Project Name	2X800 MW KAWAI PH-II
Consignee Address	Adani Power limited, Kawai, 2 x 800 MW(Phase-II) Thermal Power project, Village - Kawai, Tehsil - Atru, Baran -District, Rajasthan Pin-325219
[F] Project Name	2X800 MW KAWAI PH-III
Consignee Address	Adani Power limited, Kawai, 2 x 800 MW(Phase-III) Thermal Power project, Village - Kawai, Tehsil - Atru, Baran -District, Rajasthan PIN-325219
[G] Project Name	2X800 MW Mahan TPP (PH-III)
Consignee Address	Mahan Energen Limited 2x800 MW (Phase-III) Mahan Ultra Supercritical Thermal Power Project, Village: Bandhoura, Karsualal Tehsil: Waidhan, District-Singrauli, Pin - 486886, Madhya Pradesh

3. EARNEST MONEY DEPOSIT (EMD):

All interested vendors must submit their e-bid along with the proof of submission of following Earnest Money Deposit (EMD) details in GeM portal along with offer. EMD is exempted as per GeM provisions applicable on GeM & mentioned at para no. 3.2 of this ATC.

Details	Amount In INR	Type
EMD	INR 6,00,000/- (Six lakhs only)	Refundable

3.1: Modes of deposit: The EMD may be accepted only in the following forms:

- (i) Electronic Fund Transfer credited in BHEL account (before tender opening).
- (ii) Banker's cheque/ Pay order/ Demand draft, in favour of BHEL (along with offer).
- (iii) Fixed Deposit Receipt (FDR).
- (iv) Bank Guarantee from any of the Scheduled Banks.
- (v) Insurance Surety Bonds.
- (vi) The EMD shall remain valid for a period of 45 (forty-five) days beyond the final bid validity period as asked in NIT.

For E-Payment, the RTGS details are as mentioned below:

Bank Details	SWIFT Details of bank	Contact Details of Banker
STATE BANK OF INDIA RANIPUR BRANCH, OPP: BHEL MAIN GATE, SECTOR-5, RANIPUR, HARIDWAR, UTTRAKHAND, INDIA PIN CODE: 249403	SWIFT NO : SBININBB225 CC ACCOUNT NO : 10667995458 IFSC CODE : SBIN0000586	Contact No. +91 1334 224201 +91 1334 226125 Fax: +91 1334 226512

3.2: Exemption of EMD

As per GeM GTC following are the exempted category of EMD/Bid Security.

- a. Micro and Small Enterprises (MSEs) who are holding valid Udyam Registration and are manufacturer of the offered Product/Service (Primary Product / Service - in case of bunch bid with total value wise evaluation) and give specific confirmation to this effect at the time of bid submission and claim EMD exemption and whose credentials are validated online through Udyam Registration website of Ministry of MSME and also through supporting document uploaded during bidding process and validated by the Buyer. State Government Buyers may, however, choose to exempt only MSEs from the State of Bid Inviting Authority by specifying the same in ATC of the Bid. In case no such ATC is included, eligible MSEs of all states are exempted.
- b. Start-ups as recognized by Department for Promotion of Industry and Internal Trade (DPIIT), holding valid Start-up Recognition Certificate which is to be uploaded while bidding and claiming EMD exemption and to be validated by the Buyer. Bidder to ensure that turnover for any of the financial years has not exceeded beyond limits prescribed in the certificate / Start Up scheme of DPIIT.
- c. KVIC, ACASH, WDO, Coir Board, TRIFED and Kendriya Bhandar.
- d. Sellers who have got their credentials verified through the process of Vendor Assessment by Vendor Assessment Agencies for the Primary Product / Primary Service for which Bid / RA has been invited and holding valid Vendor Assessment or Vendor Assessment Exemption Report / confirmation (Seller to upload VA report / VAE confirmation to be validated by the Buyer).
- e. Sellers / Service Provider having annual turnover of INR 500 Crore or more, at least in one of the past three completed financial year(s)
- f. Sellers / Service Providers holding valid BIS License for the Primary Product Category whose credentials are validated through BIS database and through uploaded supporting documents to be validated by the buyer.
- g. Central / State PSUs.
- h. In addition to above GeM conditions, offers directly from the manufacturer or their authorized agents are also exempted from submission of EMD.

3.3: Forfeiture of EMD:

- a. A bidder's EMD will be forfeited if the bidder withdraws or amends its/his tender or impairs or derogates from the tender in any respect within the period of validity of the tender or if the successful bidder fails to furnish the required performance security within the specified period mentioned in the Tender.
- b. EMD by the tenderer to be withheld in case any action on the bidder is envisaged under the provisions of extant "Guidelines on Suspension of business dealings with suppliers/ contractors" and forfeited/ released based on the action as determined under these guidelines.
- c. Bid securities of the unsuccessful bidders shall be returned to them after expiry of the final bid validity period / latest by the 30th day after the award of the contract. Since it is a two-part bidding, bid securities of unsuccessful bidders during first stage i.e. technical evaluation shall be returned within 30 days of declaration of result of first stage i.e. technical evaluation.
- d. Bid security/EMD of the successful bidder shall be returned only on conclusion of the order and receipt of a Performance Security/Performance Bank Guarantee of 10% of contract value (excluding taxes) from contractor / Supplier.
- e. EMD/PBG/PS shall not carry any interest.

4. PERFORMANCE SECURITY/PERFORMANCE BANK GUARANTEE:

Successful bidder to submit Performance Security/Performance Bank Guarantee of 5% of the contract Value (Excluding Taxes). The Performance Security/PBG shall be submitted within 30 days of notification of the award of Contract and it should remain valid for a period of 60 (sixty) days beyond the date of completion of all contractual obligations of the supplier, including warranty obligations.

PS/PBG shall be returned to the contractor without interest, after the contractor duly performs and completes the contract in all respects but not later than 60 (sixty) days of completion of all such obligations including the warranty under the contract. The Performance Security/PBG shall not carry any interest.

4.1 Modes of deposit of PS/ PBG: Performance Security/Performance Bank Guarantee shall be furnished in the following forms:

- I. Local cheques of Scheduled Banks (subject to realization)/ Pay Order/Demand Draft/ Electronic Fund Transfer in favour of BHEL.
- II. Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL.
- III. Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL).
- IV. Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL).
- V. Insurance Surety Bond.

(Note: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith)

4.2: Forfeiture of Performance Security/Performance Bank Guarantee:

The Performance Security/ Performance Bank Guarantee will be forfeited and credited to BHEL's account in the event of a breach of contract by the supplier.

4.3: Performance Security shall be refunded to the Supplier/Vendor without interest, after the Supplier/Vendor duly performs and completes the contract in all respects but not later than 60(sixty) days of completion of all such obligations including the warranty under the contract.

4.4 : The Performance Security shall not carry any interest.

4.5 : There is no exemption of Performance security deposit submission for MSE Vendors.

5.BUYERS SPECIFIC ADDITIONAL TERMS & CONDITIONS IN ADDITION TO GTC

Sl. No.	Terms	Description	Supplier confirmation
1.	Documents Checklist:	<p>Please submit signed and stamped copy of your offer on each page along with following documents;</p> <ul style="list-style-type: none"> • Buyer Specific T&C. • Technical PQR & its supportive document. • Technical drawing & purchase specification. • Certificate/self-certification for minimum local content as per PPP-MII order. • Replica of price bid schedule without prices with part-I offer. 	
2.	Special Instruction of Technical requirement	<ol style="list-style-type: none"> 1. SPECIFICATION ST39013(REV. NO.-08), CHECK LIST FOR DCS, PQR, DRG. NO.418101H3008 CUSTOM BID FOR GEM AND ADDENDUM 411928J8100 ARE ENCLOSED. 2. OIL PURIFIER SHALL BE 7500LPH, DCS BASED, MANUAL CLEANING TYPE AND HEATER RATING 90 KW. 3. PERFORMANCE TEST OF PARTICLE SIZE & MOISTURE IMPURITIES FOR LUBE OIL (ISO VG-46) AS MENTIONED IN SL.NO.5(A) OF SPEC- ST39013 TO BE DONE BY VENDOR FREE OF COST, IF REQUIRED.BOTH THE TEST SHALL BE CARRIED OUT FROM CMTI/NABL ACCREDITED LAB. 4. TWO DAYS OF VENDOR ENGINEER IS REQUIRED FOR SUPERVISION DURING 5. ERECTION & COMMISSIONING OF ONE OIL PURIFICATION SYSTEM AT SITE. 6. PIPING, VALVE BODY & ITS INTERNAL AND ALL OTHER COMPONENT OF OIL PURIFICATION SYSTEM COMING IN CONTACT WITH OIL SHALL BE IN STAINLESS STEEL CONSTRUCTION. 7. CONTROL PANEL COLOR SHALL BE - EXTERNAL(FRONT & REAR)-GREY 9002 EXTERNAL (SIDE)-BLUE 5012 INTERNAL-BRILLIANTWHITE GLOSSY. 8. SEVEN (7) NUMBER HARD COPIES AND TWO (2) NUMBER CDS OF O&M MANUAL TO BE SUPPLIED BY VENDOR AT BHEL HARIDWAR . 9. EFFICIENCY OF MOTOR- IE3 	
3.	Supervision of erection & commissioning.	<p>Kindly note that the vendor shall carry out supervision work during Erection & Commissioning at site.</p> <p>Kindly Confirm that following charges have been quoted separately in your offer:</p> <ol style="list-style-type: none"> 1. Per Visit Charges for Supervision during Erection & Commissioning (lumpsum & inclusive of everything). 2. Per day charges inclusive of all i.e. lodging, fooding, boarding, taxes & duties etc.). <p>One Visit (for a period of 02 days tentatively) would be taken for the evaluation of these charges for Each No. of Oil Purification Unit.</p> <p>Payment shall be done for the actual no. of days worked at site which should be certified by BHEL site.</p> <p>Kindly ensure Supervision charges should be quoted including GST in your offer.</p>	
4.	Compliance of GTC on GeM	General Terms and Conditions on GeM 4.0 (Version 1.23) Dtd -05/03/2025 or it's latest revision of GeM portal shall be applicable against this enquiry. Kindly confirm to compliance the same for this tender.	
5.	Pre-Qualification Requirements	The Pre-Qualification Requirements have been compiled. All the bidders should ensure submission of complete details and documents as called for in these requirements. The Offers submitted by the bidders would be scrutinized with respect to Pre-Qualification Requirements first. Techno-Commercial offer of only those bidders shall be evaluated who meet the Pre-Qualification Requirements.	
6.	Customer approval requirement	<p>Bidders are requested to submit their credentials along with offer (Credentials should include BHEL P.O.s on vendor for the same rating or higher rating turbines, Experience of vendor with state utilities and major PSU like NTPC, End User Certificate wherever available), in order to take up with end customer for approval</p> <p>Supplier to submit following credentials for arranging Customer approval: -</p> <ul style="list-style-type: none"> • Company Profile 	

		<ul style="list-style-type: none"> • List of Order Executed/ on hand for Power Sector/Gov. organization of same /similar items • Copy of Major Supply Orders • Performance Certificates for Satisfactory working of System/ Equipment from end users Item. <p>The offer of only those bidders, who meet Pre-qualification requirement (PQR), Technical requirement and approved by the End Customer, will be considered for price-bid opening & RA for the requirement against this enquiry.</p>	
7.	Make in India Clause	<p>“For this procurement, the local content to categorize a supplier as a Class-I Local Supplier / Class-II Local Supplier/ Non-Local Supplier and purchase preference to Class-I Local Supplier, is as defined in Public Procurement (Preference to Make in India), Order-2017 Ref. No. P-45021/2/2017-PP (BE-II) dtd. 04/06/2020 issued by DPIIT. In case of subsequent orders issued, by the nodal ministry, changing the definition of local content for the items of this NIT, but before opening of Part-II bids against this NIT</p> <p>As per Make in India Order, only Class-1 and Class-2 local supplies are eligible to bid in this tender enquiry.</p> <p>For this eligibility criteria, bidders are required to submit certificate of Minimum local content as specified in attached Make In India Declaration format.</p>	
8.	Compliance of Rule 144 (xi) of GFR 2017	Compliance of Restrictions under Rule 144 (xi) of GFR 2017 shall be as per GeM.	
9.	Bid validity/ Validity of offer	<p>Please note that validity of the offer shall be 180 days from the date opening of Techno-Commercial bid (Part-I bid) on GeM portal.</p> <p>Offer of bidder's having validity less than 180 days shall liable to reject. Please confirm.</p> <p>The required validity is considering that offer is complete & clear w.r.t. PQR and all techno-commercial conditions. Vendors need to extend their offer validity for the time taken by them in responding BHEL's comments/clarification sought during techno-commercial scrutiny of the offer. In case regret by any bidder for such validity extension, their offer shall liable to be reject. Please confirm.</p>	
10.	Loading and unloading	<p>Vendor's scope will not cover Loading & Unloading at Final destination of delivery. Unloading at final destination (i.e. BHEL site) is in BHEL 'scope.</p> <p>Loading and unloading at other intermediate places due to any permitted transshipment will be the responsibility of the vendor. Kindly note</p>	
11.	Prices/Basis of Quotation	<p>The offered prices of the items shall remain firm and fixed till the execution of the contract, kindly confirm.</p> <p>Kindly confirm that your quote prices are inclusive of P&F, Freight & GST for Total quantity on GeM portal.</p> <p>Transit Insurance would be arranged by BHEL. Please quote your prices accordingly.</p> <p>The prices are to be quoted on Ex-Works with freight Pre-paid up to project destination basis. The goods must be dispatched through any Bank approved transporters having their branch at Haridwar. The names and addresses of transporters approved by IBA as well as BHEL are posted at our website www.bhelhwr.co.in. Please note that, if you dispatch the material by any BHEL un-approved transporter then you will necessarily be required to furnish the MRC (Material Receipt Certificate) from respective Project Site for processing of your invoice. No demurrage charges would be borne by BHEL.</p>	
12.	Special Instructions:	<p>a. ADADNI projects:</p> <ul style="list-style-type: none"> • Please inform 8 digit HSN code for Leak Steam Valve along with spares. • 08 DIGIT GST HSN CODE to be provided & mentioned in your invoice & packing list. • Invoice, GR/LR, packing list, Test certificate are required in original for billing to end user. • Loose items one marker board needs to be send for each bundle for fixing RFID tag at site. 	

		<ul style="list-style-type: none">Material for unit-1, unit-2, commissioning spares and mandatory spares needs to be packed in separate boxes and same is required to be marked on the box & packing list.Vendor to ensure submission billing documents in the same month of material despatch. If vendor fail to provide the despatch documents in the same month GST Penalty shall be applicable and bear by vendor as per GST rule.									
13.	Evaluation criteria	Evaluation would be done on the basis of total landed cost for the complete scope/requirement covered in the enquiry Considering total material value, supervision charges, type test charges (if applicable), Packing charges, Forwarding Charges, taxes & duties, Freight & Insurance).									
		Prices of only those bidders who are approved by the End User will be considered for evaluation against requirement of Adani Projects.									
14.	Evaluation Currency	The evaluation currency for this tender shall be INR.									
15.	Payment terms:	<p>For Material portion: The payment shall be done after receipt of Material at BHEL respective project site, within no. of days as defined in the below table from the date of receipt of Material at site i.e. MRC date).</p> <table><tr><td>Type of Bidder</td><td>Payment Terms (Number of Days)</td></tr><tr><td>Micro & Small Enterprises (MSEs)</td><td>45 days</td></tr><tr><td>Medium Enterprises</td><td>60 days</td></tr><tr><td>Non MSME</td><td>90 days</td></tr></table> <p>The Payment terms are subject to receipt of non-discrepant document from supplier.</p> <p>Payment terms for Supervision charges during Erection & Commissioning: 100% payment against submission of successful Erection & Commissioning certificate from Project Site or MOM.</p>	Type of Bidder	Payment Terms (Number of Days)	Micro & Small Enterprises (MSEs)	45 days	Medium Enterprises	60 days	Non MSME	90 days	
Type of Bidder	Payment Terms (Number of Days)										
Micro & Small Enterprises (MSEs)	45 days										
Medium Enterprises	60 days										
Non MSME	90 days										
16.	GeM charges	GeM charges if any shall be either side only i.e. buyer's GeM charges shall be in buyer's account and seller's GeM charges shall be on seller's account. Please confirm.									
17.	Contract execution	Bidder's are advised to read GeM related query & clarification carefully on GeM portal. Order shall be executed through GeM.									
18.	Reverse Auction (E-bidding)	BHEL shall be resorting to Reverse Auction (RA) on GEM portal as per GEM functionalities for this tender. RA shall be conducted among the techno-commercially qualified bidders.									
19.	Quantity Variation	<p>BHEL reserves the right to cancel tender or reject any or all the quotations without assigning any reasons thereof.</p> <p>BHEL also reserves the right to Increase or decrease the tendered quantities or quantity of individual material code may be dropped as a whole also.</p> <p>Vendors should be prepared to accept order for reduced Quantity without any extra charges. Vendor should also be prepared for giving discount in case of Increase in Quantity. Vendor has to take manufacturing clearance from BHEL before starting manufacturing of material. In case ordered quantity is reduced at the time of manufacturing clearance, then payment shall be made accordingly as per decreased quantity. Kindly confirm.</p>									
20.	Delivery Period	<p>Please note that BHEL's Delivery requirements are mentioned in point no 1 of above. Early delivery w.r.t. above lot delivery will be accepted only after written confirmation from BHEL. BHEL reserve right to reject early delivery request of bidders / suppliers. Delivery period indicated in GeM bid is only indicative and final delivery of tender shall be taken as mentioned above.</p> <p>Accordingly bidders to confirm the above deliveries or quote their best possible delivery in no of months / weeks from the date of placement of Purchase order, including all activities like document approval, inspection by TPI time etc.</p>									
21.	Technical Document/	Drawings/Data sheets/documents/QAP etc. as called for in the specifications shall be submitted by Vendor for BHEL/ Customer approval within 30 days of purchase order. BHEL									

	Drawing approval conditions	<p>shall approve these drawings/data sheets/ documents / QAP etc. within 30 days of receipt. Any comments on the documents shall be given by BHEL within 7 days of submission and vendor shall submit revised document / reply to comments, within 7 days of BHEL comments. However, total time for Document submission and approval shall not exceed 30 days for respective party.</p> <p>Delivery is from the date of PO, accordingly, delay in submission / revision of the documents by the vendor will automatically account for to vendor. In case of delay on account of BHEL in comments / approval of the documents, the delivery shall be re-scheduled by the no of days taken by BHEL in excess to 30 days. For delay analysis cumulative no of days (including time taken in comments), shall be considered for delivery extension.</p>	
22.	Liquidated Damages (LD) for late delivery	<p>Liquidated Damages shall be lot wise as per clause no. 15 (iii) of General terms and conditions on GeM 4.0 (Version 1.22) as under: kindly confirm.</p> <p>"If the Seller/Service Provider fails to deliver any or all of the Goods/Services within the original/re-fixed delivery period(s) specified in the contract, the Buyer will be entitled to deduct/recover the Liquidated Damages for the delay, unless covered under Force Majeure conditions aforesaid, @ 0.5% of the contract value of delayed quantity per week or part of the week of delayed period as pre-estimated damages not exceeding 10% of the contract value of delayed quantity without any controversy/dispute of any sort whatsoever".</p> <p>The date of LR would be treated as the date of delivery for penalty purposes.</p>	
23.	MDCC clause	<p>Please note that, material shall be dispatched only after issue of Material dispatch clearance certificate (MDCC) from end customer. For issue of MDCC, vendors are required to submit all test certificates (TC) and inspection report of third party (IR) to BHEL. After review & acceptance of the quality document, BHEL will forward the same to end customer for issuance of MDCC.</p> <p>MDCC shall be issued within 7 days of receipt of complete quality documents / TCs,. In case of delay in issuance of MDCC, only delivery shall be extended by no of days taken by BHEL in excess to 7 days and all other terms and conditions of PO shall remains same & binding.</p> <p>In case any material is dispatched without MDCC and any loss is incurred by Supplier/Vendor for any reason whatsoever, BHEL shall not be responsible in any manner to compensate the supplier in this regard.</p> <p>Kindly confirm.</p>	
24.	BREACH OF CONTRACT, REMEDIES AND TERMINATION:	<p>The following shall amount to breach of contract:</p> <p>I. Non-supply of material/ non-completion of work by the Supplier/Vendor within scheduled delivery/ completion period as per contract or as extended from time to time.</p> <p>II. The Supplier/Vendor fails to perform as per the activity schedule and there are sufficient reasons even before expiry of the delivery/ completion period to justify that supplies shall be inordinately delayed beyond contractual delivery/ completion period.</p> <p>III. The Supplier/Vendor delivers equipment/ material not of the contracted quality.</p> <p>IV. The Supplier/Vendor fails to replace the defective equipment/ material/ component as per guarantee clause.</p> <p>V. Withdrawal from or abandonment of the work by the Supplier/Vendor before completion as per contract.</p> <p>VI. Assignment, transfer, subletting of Contract by the Supplier/Vendor without BHEL's written permission resulting in termination of Contract or part thereof by BHEL.</p> <p>VII. Non-compliance to any contractual condition or any other default attributable to Supplier/Vendor.</p> <p>VIII. Any other reason(s) attributable to Vendor towards failure of performance of contract. In case of breach of contract, BHEL shall have the right to terminate the Purchase Order/ Contract either in whole or in part thereof without any compensation to the Supplier/Vendor.</p> <p>IX. Any of the declarations furnished by the contractor at the time of bidding and/ or entering into the contract for supply are found untruthful and such declarations were of a nature that could have resulted in non-award of contract to the contractor or could expose BHEL and/ or Owner to adverse consequences, financial or otherwise.</p>	

		<p>X. Supplier/Vendor is convicted of any offence involving corrupt business practices, antinational activities or any such offence that compromises the business ethics of BHEL, in violation of the Integrity Pact entered into with BHEL has the potential to harm the overall business of BHEL/ Owner.</p> <p>Note-Once BHEL considers that a breach of contract has occurred on the part of Supplier/Vendor, BHEL shall notify the Supplier/Vendor by way of notice in this regard. Contractor shall be given an opportunity to rectify the reasons causing the breach of contract within a period of 14 days.</p> <p>In case the contractor fails to remedy the breach, as mentioned in the notice, to the satisfaction of BHEL, BHEL shall have the right to take recourse to any of the remedial actions available to it under the relevant provisions of contract.</p> <p>Remedies in case of Breach of Contract.</p> <p>i) Wherein the period as stipulated in the notice issued under above clause has expired and Supplier/Vendor has failed to remedy the breach, BHEL will have the right to terminate the contract on the ground of "Breach of Contract" without any further notice to contractor.</p> <p>ii) Upon termination of contract, BHEL shall be entitled to recover an amount equivalent to 10% of the Contract Value for the damages on account of breach of contract committed by the Supplier/Vendor. This amount shall be recovered by way of encashing the security instruments like performance bank guarantee etc available with BHEL against the said contract. In case the value of the security instruments available is less than 10% of the contract value, the balance amount shall be recovered from other financial remedies (i.e. available bills of the Supplier/Vendor, retention amount, from the money due to the Supplier/Vendor etc. with BHEL) or the other legal remedies shall be pursued.</p> <p>iii) wherever the value of security instruments like performance bank guarantee available with BHEL against the said contract is 10% of the contract value or more, such security instruments to the extent of 10% contract value will be encashed. In case no security instruments are available or the value of the security instruments available is less than 10% of the contract value, the 10% of the contract value or the balance amount, as the case may be, will be recovered in all or any of the following manners:</p> <p>iv) In case the amount recovered under sub clause (a) above is not sufficient to fulfil the amount recoverable then; a demand notice to deposit the balance amount within 30 days shall be issued to Supplier/Vendor.</p> <p>v) If Supplier/Vendor fails to deposit the balance amount within the period as prescribed in demand notice, following action shall be taken for recovery of the balance amount:</p> <p>a) from dues available in the form of Bills payable to defaulted Supplier/Vendor against the same contract.</p> <p>b) If it is not possible to recover the dues available from the same contract or dues are insufficient to meet the recoverable amount, balance amount shall be recovered from any money(s) payable to Supplier/Vendor under any contract with other Units of BHEL including recovery from security deposits or any other deposit available in the form of security instruments of any kind against Security deposit or EMD.</p> <p>vi) In-case recoveries are not possible with any of the above available options, Legal action shall be initiated for recovery against defaulted supplier/Vendor.</p> <p>vii) It is an agreed term of contract that this amount shall be a genuine pre-estimate of damages that BHEL would incur in completion of balance contractual obligation of the contract through any other agency and BHEL will not be required to furnish any other evidence to the Supplier/Vendor for the purpose of estimation of damages.</p> <p>viii) In addition to the above, imposition of liquidated damages, debarment, termination, de-scoping, short-closure, etc., shall be applied as per provisions of the contract.</p> <p>Note:</p> <p>1) The defaulting Supplier/Vendor shall not be eligible for participation in any of the future enquiries floated by BHEL to complete the balance work. The defaulting contractor shall mean and include:</p> <p>(a) In case defaulted Supplier/Vendor is the Sole Proprietorship Firm, any Sole Proprietorship Firm owned by same Sole Proprietor.</p> <p>(b) In case defaulted Supplier/Vendor is The Partnership Firm, any firm comprising of same</p>	
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		partners/ some of the same partners ; or sole proprietorship firm owned by any partner(s) as a sole proprietor.	
25.	Suspension of Business Dealings with Suppliers / Contractors:	<p>The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the banned firms / principal / agents, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com.</p> <p>If any bidder / supplier / contractor during pre-tendering / tendering / post tendering / award / execution / post-execution stage indulges in any act, including but not limited to, mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or tampers the tendering process or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860(Bhartiya Nyaya Samhita 2023) or any other law in force in India, or does anything which is actionable under the Guidelines for Suspension of Business dealings, action may be taken against such bidder / supplier / contractor as per extant guidelines of the company available on www.bhel.com and / or under applicable legal provisions. Guidelines for suspension of business dealings is available in the webpage: http://www.bhel.com/vender_registration/vender.php.</p>	
26.	Settlement of Dispute, CONCILIATION & ARBITRATION: :	<p>Settlement of Dispute</p> <p>If any dispute or difference of any kind whatsoever shall arise between BHEL and the Supplier/Vendor, arising out of the contract for the performance of the work whether during the progress of contract termination, abandonment or breach of the contract, it shall in the first place referred to Designated Officer / IEM for amicable resolution by the parties. Designated Officer / IEM who within 60 days after being requested shall give written notice of his decision to the contractor. Save as hereinafter provided, such decision in respect of every matter so referred shall forthwith be given effect to by the Supplier/Vendor who shall proceed with the work with all due diligence, whether he or BHEL desires to resolve the dispute as hereinafter provided or not. If after the Designated Engineer has given written notice of this decision to the party and no intention to pursue the dispute has been communicated to him by the affected party within 30 days from the receipt of such notice, the said decision shall become final and binding on the parties. In the event the Supplier/Vendor being dissatisfied with any such decision or if amicable settlement cannot be reached then all such disputed issues shall be resolved through conciliation in terms of the BHEL Conciliation Scheme 2018 as per 'CONCILIATION' Clause.</p> <p>CONCILIATION:</p> <p>Any dispute, difference or controversy of whatever nature howsoever arising under or out of or in relation to this Agreement (including its interpretation) between the Parties, and so notified in writing by either Party to the other Party (the "Dispute") shall, in the first instance, be attempted to be resolved amicably in accordance with the conciliation procedure as per BHEL Conciliation Scheme 2018. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in - "Procedure for conduct of conciliation proceedings" (as available in www.bhel.com).</p> <p>Note: Ministry of Finance has issued OM reference No. 1/2/24 dated 03.06.2024 regarding "Guidelines for Arbitration and Mediation in Contracts of Domestic Public Procurement. In the said OM it has been recommended that Government departments/ Entities/agencies are to encourage mediation under the Mediation Act. 2023. The said Act has not yet been notified by the Government. Therefore, the clause "Settlement of Disputes" shall be modified accordingly as and when the Mediation Act 2023 gets notified.</p> <p>ARBITRATION:</p> <p>Except as provided elsewhere in this Contract, in case Parties are unable to reach amicable settlement (whether by Conciliation to be conducted as provided herein above or otherwise) in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the Parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract (hereinafter referred to as the 'Dispute'), then, either Party may, refer the disputes to Arbitral Institution and such dispute to be adjudicated by Sole Arbitrator appointed in accordance with the Rules of said Arbitral Institution.</p>	

		<p>A party willing to commence arbitration proceeding shall invoke Arbitration Clause by giving notice to the other party in terms of section 21 of the Arbitration & Conciliation Act, 1996 (hereinafter referred to as the 'Notice') before referring the matter to arbitral institution. The Notice shall be addressed to the Head of the Region, Power Sector/ Unit, BHEL, executing the Contract and shall contain the particulars of all claims to be referred to arbitration with sufficient detail and shall also indicate the monetary amount of such claim including interest, if any.</p> <p>After expiry of 30 days from the date of receipt of aforesaid notice, the party invoking the Arbitration shall submit that dispute to the Arbitral Institutions (shall be identified by the contract issuing agency) and that dispute shall be adjudicated in accordance with their respective Arbitration Rules. The matter shall be adjudicated by a Sole Arbitrator who shall necessarily be a Retd Judge having considerable experience in commercial matters to be appointed/nominated by the respective institution. The cost/expenses pertaining to the said Arbitration shall also be governed in accordance with the Rules of the respective Arbitral Institution. The decision of the party invoking the Arbitration for reference of dispute to a specific Arbitral institution for adjudication of that dispute shall be final and binding on both the parties and shall not be subject to any change thereafter. The institution once selected at the time of invocation of dispute shall remain unchanged.</p> <p>The fee and expenses shall be borne by the parties as per the Arbitral Institutional rules.</p> <p>The Arbitration proceedings shall be in English language and the seat and venue of Arbitration shall be at the court(s) of Haridwar.</p> <p>Subject to the above, the provisions of Arbitration & Conciliation Act 1996 and any amendment thereof shall be applicable. All matters relating to this Contract and arising out of invocation of Arbitration clause are subject to the exclusive jurisdiction of the Court(s) situated at Haridwar , shall have exclusive jurisdiction.</p> <p>Notwithstanding any reference to the Designated Engineer or Conciliation or Arbitration herein, a. the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree. Settlement of Dispute clause cannot be invoked by the Contractor, if the Contract has been mutually closed or 'No Demand Certificate' has been furnished by the Contractor or any Settlement Agreement has been signed between the Employer and the Contractor.</p> <p>It is agreed that Mechanism of resolution of disputes through arbitration shall be available only in the cases where the value of the dispute is less than Rs. 10 Crores.</p> <p>In case the disputed amount Claim, Counter claim including interest is Rs. 10 crores and above, the parties shall be within their rights to take recourse to remedies other than Arbitration, as may be available to them under the applicable laws after prior intimation to the other party. Subject to the aforesaid conditions, provisions of the Arbitration and Conciliation Act, 1996 and any statutory modifications or re-enactment thereof as amended from time to time, shall apply to the arbitration proceedings under this clause.</p> <p>In case, multiple arbitrations are invoked (whether sub-judice or arbitral award passed) by any party to under this contract, then the cumulative value of claims (including interest claimed or awarded) in all such arbitrations shall be taken in account while arriving at the total claim in dispute for the subject contract for the purpose of clause mentioned above. Disputes having cumulative value of less than 10 crores shall be resolved through arbitration and any additional dispute shall be adjudicated by the court of competent jurisdiction.</p>	
27.	Action against Bidders / vendor / supplier / contractor in case of default:	<p>In order to protect the commercial interests of BHEL, BHEL shall take action against supplies / contractors by way of suspension of business dealings, who either fail to perform or are in default without any reasonable cause, cause loss of business/ money/ reputation, indulge in malpractices, cheating, bribery, fraud or any other misconduct or formation of cartels so as to influence the bidding process or influence the price etc.</p> <p>Suspension of Business Dealings could be in the form of "Hold" or "Banning" a supplier/ contractor or a bidder and shall be as per "Guidelines for Suspension of Business Dealings with Suppliers/ Contractors" available at BHEL's website</p>	

		"https://www.bhel.com/guidelines-suspension-business-dealings-supplierscontractors"																			
28.	MICRO AND SMALL ENTERPRISES (MSE):	<p>Any Bidder falling under MSE category shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer.</p> <table><tr><td>Type under MSE</td><td>SC/ST owned</td><td>Women owned</td><td colspan="2">Others (excluding SC/ ST & Women Owned)</td></tr><tr><td>Micro</td><td></td><td></td><td colspan="2"></td></tr><tr><td>Small</td><td></td><td></td><td colspan="2"></td></tr></table> <p>Note: If the bidder does not furnish the above, offer shall be processed construing that the bidder is not falling under MSE category.</p> <p>a) MSE suppliers can avail the intended benefits in respect of the procurements related to the Goods and Services only (Definition of Goods and Services as enumerated by Govt. of India vide Office Memorandum F. No. 21(8)/2011-MA dtd. 09/11/2016 office of AS & DC, MSME) only if they submit along with the offer, attested copies of either Udyam Registration. Date to be reckoned for determining the deemed validity will be the last date of Technical Bid submission. Non-submission of supporting document in GeM portal will lead to consideration of their bids at par with other bidders. No benefits shall be applicable for this enquiry if the above required documents are not uploaded at the time of bid submission. Documents submitted by the bidder shall be verified by BHEL for rendering the applicable benefits.</p>				Type under MSE	SC/ST owned	Women owned	Others (excluding SC/ ST & Women Owned)		Micro					Small					
Type under MSE	SC/ST owned	Women owned	Others (excluding SC/ ST & Women Owned)																		
Micro																					
Small																					
29.	JURISDICTION:	<p>This contract shall be governed by the Law for the time being in force in the Republic of India. Subject to clause(s) mentioned above of this contract, the Civil Court having original Civil Jurisdiction at Haridwar shall alone have exclusive jurisdiction in regard to all matters in respect of the Contract.</p>																			
30.	Force Majeure	<p>"Force Majeure" shall mean circumstance which is: a) beyond control of either of the parties to contract, b) either of the parties could not reasonably have provided against the event before entering into the contract, c) having arisen, either of the parties could not reasonably have avoided or overcome, and d) is not substantially attributable to either of the parties And Prevents the performance of the contract, Such circumstances include but shall not be limited to: i) War, hostilities , invasion, act of foreign enemies. ii) Rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war. iii) Riot, commotion or disorder by persons other than the contractor's personnel and other employees of the contractor and sub-contractors. iv) Strike or lockout not solely involving the contractor's personnel and other employees of the contractor and sub-contractors. v) Encountering munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the contractor's use of such munitions, explosives, radiation or radio- activity. vi) Natural catastrophes such as earthquake, tsunami, volcanic activity, hurricane or typhoon, flood, fire, cyclones etc. vii) Epidemic, pandemic etc.</p> <p>The following events are explicitly excluded from Force Majeure and are solely the responsibilities of the non-performing party: a) any strike, work-to-rule action, goslow or similar labour difficulty (b) late delivery of equipment or material (unless caused by Force Majeure event) and (c) economic hardship.</p> <p>If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within 15 (fifteen) days after the occurrence of such event.</p> <p>The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The Time for Completion shall be extended by a period of time equal to period of delay caused due to such Force Majeure event.</p>																			

		<p>Delay or non-performance by either party hereto caused by the occurrence of any event of Force Majeure shall not</p> <p>i) Constitute a default or breach of the Contract. ii) Give rise to any claim for damages or additional cost expense occasioned thereby, if and to the extent that such delay or non-performance is caused by the occurrence of an event of Force Majeure.</p> <p>BHEL at its discretion may consider short closure of contract after 1 year of imposition of Force Majeure in line with extant guidelines. In any case, Supplier/Vendor cannot consider deemed short-closure after 1 year of imposition of Force Majeure</p>	
31.	Cartel Formation	<p>The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.</p>	
32.	Order of Precedence:	<p>In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:</p> <ol style="list-style-type: none"> Amendments/Clarifications/Corrigenda/Errata etc. issued in respect of the tender documents by BHEL. Buyer Added Bid Specific ATC GeM Bid Technical Conditions of Contract (TCC) GeM GTC 	
33.	Conflict of interest:	<p>A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:</p> <ol style="list-style-type: none"> they have controlling partner (s) in common; or they receive or have received any direct or indirect subsidy/financial stake from any of them; or they have the same legal representative/agent for purposes of this bid; or they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; or Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from. one bidding manufacturer in more than one bid; or In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorize only one agent/dealer. There can be only one bid from the following: 1. The principal manufacturer directly or through one Indian agent on his behalf; and 2. Indian/foreign agent on behalf of only one principal or A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid or In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business. 	
34.	Guarantee	<p>Kindly confirm that Guarantee shall be provided for a period of “36 months from the date of dispatch or 18 months from the date of commissioning, whichever is earlier”. In case of any failure or trouble reported from site, the supplier should depute their representative immediately to attend the problem and replace the defective component/part if required, without any additional cost to BHEL.</p>	
		<p>Supplier shall be responsible for free replacement of defective equipment / material at our site</p>	
		<p>Please note that offers with guarantee period lesser than above mentioned guarantee period may result in rejection of the offer.</p>	

35.	Order Acceptance:	Ink signed order acceptance shall be furnished within 15 days of order placement. In case, order acceptance do not received within 15 days of order placement, PO deemed to be accepted by you.															
36.	Beneficiary of PO	Kindly confirm on whom the PO will be placed in the event of ordering.															
37.	Dispatch documents	Following dispatch documents to be provided immediately after directly dispatch to BHEL Project site for billing purpose: <ul style="list-style-type: none">• Guarantee/Warrantee Certificates• E- Invoice and commercial invoice• GeM invoice• Original consignee copies of GR/LR/RR (Material shall be dispatched on door delivery basis without consignee copy)• Packing list• Original GST compliance certificate• E-way bill• MRC/POD/Receipted LR/RR/GR copy (as per proof of delivery of material at BHEL Project site)															
38.	Integrity Pact	<p>(a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.</p> <table><tr><th>SI</th><th>IEM</th><th>Email</th></tr><tr><td>1.</td><td>Shri Otem Dai, IAS (Retd.)</td><td>iem1@bhel.in</td></tr><tr><td>2.</td><td>Shri Bishwamitra Pandey, IRAS (Retd.)</td><td>iem2@bhel.in</td></tr><tr><td>3.</td><td>Shri Mukesh Mittal, IRS (Retd.)</td><td>iem3@bhel.in</td></tr></table> <p>(b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three-part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.</p> <p>(c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.</p> <p>Note: <i>No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:</i></p> <table><tr><td>Mithlesh Kumar Maurya Designation: Addl. Engineer (PPX-BOI) 4th Floor, Main Administrative Building, HEEP, BHEL, Hardwar- 249403 Uttarakhand, India Email ID: mithleshkumar.maurya@bhel.in Tel: +91 1334 28 1690</td><td>Mr. C. L. Meena Designation: Manager (PPX-BOI) 4th Floor, Main Administrative Building, HEEP, BHEL Hardwar- 249403 Uttarakhand, India Email ID: clmeena@bhel.in Tel: +91 1334 28 1685</td></tr></table>	SI	IEM	Email	1.	Shri Otem Dai, IAS (Retd.)	iem1@bhel.in	2.	Shri Bishwamitra Pandey, IRAS (Retd.)	iem2@bhel.in	3.	Shri Mukesh Mittal, IRS (Retd.)	iem3@bhel.in	Mithlesh Kumar Maurya Designation: Addl. Engineer (PPX-BOI) 4 th Floor, Main Administrative Building, HEEP, BHEL, Hardwar- 249403 Uttarakhand, India Email ID: mithleshkumar.maurya@bhel.in Tel: +91 1334 28 1690	Mr. C. L. Meena Designation: Manager (PPX-BOI) 4 th Floor, Main Administrative Building, HEEP, BHEL Hardwar- 249403 Uttarakhand, India Email ID: clmeena@bhel.in Tel: +91 1334 28 1685	
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39.	Additional Conditions for Assessment	BHEL reserves the right to consider / Not-consider the offers based on the evaluation of documents submitted for the Pre-Qualification Criteria (PQR). BHEL also reserves the right to have on-site assessment of the facilities at supplier's works during the bid evaluation.															
40.	O&M Manuals	Kindly confirm that in the event of ordering, 7 Sets hard copies (Paper based) and 2 Set (in CD ROM) of O & M manual shall be furnished containing all drawings and datasheet, catalogues of all instruments and instructions for storage, erection & commissioning, operation and maintenance after approval. Please submit same to BHEL Haridwar after despatch of material. Kindly confirm that in the event of ordering, 02 Sets of O&M Manuals would be kept inside the dispatch box of Oil Purification Unit & the same shall also be mentioned in your Shipping/Packing List.															
41.	Quality Requirement	1a) SUB ITEM, LT MOTOR FOR FEED PUMP AND CENTRIFUGE OF OPU (Rating More Than 7.5 KW) TO BE PROCURED FROM CUSTOMER APPROVED SOURCES ONLY, WHICH ARE AS															

		UNDER:					
		27	LT MOTORS	CGL MARATHON ELECTRIC Marathon Regal Beloit Wuxi Co. Ltd. Siemens ABB BHARAT BIJALI KEC BHEL SHANGHAI ELECTRIC COMPANY XIANGTAN ELECTRIC MANUFACTURING CO LTD SIEMENS LTD JYOTI LTD. NGEP SHANGHAI SHANGDIAN ELECTRIC MACHINERY JIANGSU DAZHONG ELECTRIC MOTORS CO. LTD	AHMEDNAGAR KOLKATA China China FARIDABAD, CHINA MUMBAI BANGALORE/HUBLI BHOPAL CHINA CHINA MUMBAI, CHINA BARODA HUBLI CHINA CHINA	BOI	
		1b) SUB ITEM, LT MOTOR FOR FEED PUMP AND CENTRIFUGE OF OPU (Rating 7.5 KW & below) CAN BE PROCURED FROM OEM APPROVED SOURCES.					
		2) PLEASE REFER ATTACHED QUALITY PLAN ENDORSED BY CUSTOMER, VENDOR TO SUBMIT ENDOSRED COPY OF THIS QUALITY PLAN FOR BHEL & CUSTOMER APPROVAL.FINAL APPROVAL BY CUSTOMER WILL BE DONE AFTER POST AWARD.					
		3) IN CASE OF INDIGENOUS VENDORS: JOINT INSPECTION SHALL BE DONE BY BHEL NOMINATED INSPECTION AGENCY QUEST AND CUSTOMER AS PER FINALLY CUSTOMER APPROVED QP.					
		4) FOR SPARES: INSPECTION SHALL BE DONE AS PER CUSTOMER APPROVED QP. FOR ITEM NOT APPEARING IN CUSTOMER APPROVED QP, TC/COC SHALL BE SUBMITTED.					
		5) CUSTOMER APPROVED PAINT TO BE APPLIED AND PAINTING TO BE DONE AS PER CUSTOMER APPROVED PAINTING SPECIFICATION.					
		6) The Charges for Pre-Inspection would be borne by BHEL. However at least 15 days' notice is to be provided for arranging Pre-Inspection.					
2	Bidder Contact details	Please provide Contact details of your representative for techno-commercial clarifications: Mobile no. & Email id (minimum 2 person)					

SPECIAL NOTE FOR BIDDERS:

- In the event of our customer order covering this tender being cancelled /placed on hold /otherwise modified, BHEL would be constrained to accordingly cancel / hold / modify the tender at any stage of execution.
- BHEL may negotiate the L1 rate, if not meeting our budget / estimated cost. BHEL may re-float the tender opened, if L1 price is not acceptable to BHEL even after negotiation.
- Any change in applicable rates of Tax or any other statutory levies (Direct / Indirect) or any new introduction of any levy by means of statute and its corresponding liability for the deliveries beyond the agreed delivery date for reasons not attributable to BHEL will be to vendors account. BHEL will not reimburse the same and any subsequent claim in this respect will be summarily rejected.
- BHEL reserves its right to reject an offer due to unsatisfactory past performance by the respective Vendor in the execution of any contract to any BHEL project / Unit.
- The offers of the bidders who are under suspension and also the offers of the bidders, who engage the services of the banned firms /principal/agents, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com.
- Recovery / deduction as applicable as per Direct and Indirect taxes as notified by Govt. Of India from time to time will be made and information/certificate for such deduction/recoveries shall be provided by BHEL to the vendor.
- If the delivery of supply as detailed above gets delayed beyond the delivery period, the Supplier/Vendor shall request for a delivery extension and BHEL at its discretion may extend the Contract. However, if any 'Delivery extension' is granted to the Supplier/Vendor for completion of supply, due to backlog attributable to the Supplier/Vendor, then it shall be without prejudice to the rights of BHEL to impose LD for the delays attributable to the Supplier/Vendor.
- In case BHEL increase the quantity during currency of the contract in line with quantity variation clause of GeM bid, delivery extension on pro-rata basis shall be given for supply of these additional quantity.

Following documents are an integral part of this Tender Enquiry and endorsed copies of these documents (duly signed and stamped on each page, as a token of acceptance) are to be submitted/uploaded along with offer on GeM portal against this bid.

- Please submit replica of Price schedule (without prices) showing "quoted" in place of price along with techno-commercial bid (Part-I).
- Please submit signed & Stamped copy (each page) of duly filled of confirmation column of "Buyers Specific Additional Terms & Conditions (ATC)" and its clause wise supporting documents where required.

3. Please submit signed & stamped copy (each page) for qualifying PQR with proper filled information and related supporting documents as mentioned in PQR.
4. Please submit signed & stamped copy (each page) of Integrity Pact.
5. Please submit signed & stamped copy (each page) of REFER ATTACHED QUALITY PLAN.
6. Please submit certificate of Minimum local content as specified in the Make In India Certificate of the tender

MANUAL CLEANING TYPE OIL PURIFIER (DCS BASED)

ADDITIONAL SPECIFICATION FOR ST39013 (Rev.no. -08):

Requirements mentioned in this addendum shall supersede the corresponding requirements/clause of spec ST39013.

1. Capacity (By single machine) of oil purification system (OPS) shall be **7500 LPH**.
2. Heater rating shall be 90 kW.
3. The optional offer to be furnished by vendor for performance test of particle size & moisture impurities for lube oil (ISO VG- 46) as mentioned in sl.no.5(a) of spec-ST39013. Both the tests shall be carried out from CMTI/NABL accredited lab.
4. Type test report for capacity, particle size & moisture impurities for lube oil (ISO VG- 46) as mentioned in sl.no.5(a) of spec-ST39013 conducted within 5 years carried out from CMTI lab/NABL accredited shall be furnished by vendor.
5. Clause 5 a (ii) at page no.: 10 of Spec-ST39013 read as: - Moisture contents at the outlet of OPS shall be maximum 500 ppm from inlet of greater than or equal to 15000 ppm.
6. The material for the rotating parts of the centrifuge shall be high grade stainless steel AISI 316 or equivalent.
7. Piping, valve body & its internal and all other component of oil purification system coming in contact with oil shall be of stainless-steel construction.
8. The oil purification system (OPS) is complete skid of purifier in which centrifuge type separator is main component used for removing particle impurities and moisture contents from turbine lube oil system. Only following make separator are acceptable to BHEL: -

Sl. No.	Item Name	Make of Separator
1	Centrifuge type Separator	i. Alfa Laval ii. GEA Westfallia iii. Alternate make separator is acceptable provided OPS in which it is used meets the particle & moisture criteria mentioned in sl. no.4 above of this doc. and flow 7500LPH. Vendor to furnish customer approved type test report of such OPS for any earlier executed project. In case, vendor fails to furnish customer approved type test report doc. Vendor's offer shall not be considered.

9. Var. nos. 7,8,10 &11 of Table A of clause no 3.17 at sheet no. 06 of 40 of specification ST 39013 shall not be applicable.
10. Clause no. 3.13 at page no. 5 of 40 of Spec-ST39013 shall be ignored and shall be considered one centrifuge separator in place of multiple centrifuge to meet the flow requirement.

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MANUAL CLEANING TYPE OIL PURIFIER (DCS BASED)

11. Clause 20 A (14) & 20 A (16) at page no.36 & 37 of Spec-ST39013 shall be ignored.
12. Since unit oil purifier and central oil purifier are same, the drawings/documents to be furnished to BHEL for approval shall be common for both.
13. For paint Scheme

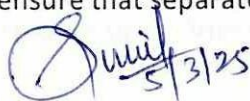
Clause 11 at page no.: 15&16 of Spec-ST39013 read as following:

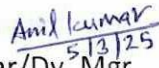
Paint (Coat)	Paint Type	No. of coat DFT*	
Primer Paint	Epoxy base Zinc rich primer paint	1 Coat	50
Intermediate Paint	Epoxy MiO Polyamide Cured Paint	1 Coat	100
Finish (Final) Paint	Aliphatic Acrylic Polyurethane Finish paint	1 Coat	75

Total DFT = 225 (microns)

Note: Touch-up paint shall be 5% of total finish coat paint qty.

14. The sizes of inlet and outlet pipe connections of oil purification system shall be NB 50mm in place of NB 40mm mentioned in P&ID of Spec-ST39013. Also, the sizes of inlet and outlet pipe connections of vented sight overflow fitting shall be NB 50mm.
15. Supervision by vendor during erection & commissioning at site shall be required.
16. List of recommended spares and commissioning spares along with price breakup of individual spares are required.
17. Vendor to provide lube oil recirculation piping/ piping connection in its scope. Vendor to note that unit oil purifier recirculation line shall be connected to outlet of purifier. For central oil purifier, oil recirculation line shall be connected to inlet of purifier.
18. Clause 5(b) at page no.: 10 and Clause 20 A (9) at page no.: 36 of Spec-ST39013 read as $\beta_5 \geq 1000$ in place of $\beta_3 = 1000$ or better.
19. Clause 3.6 at page no.: 4 of Spec-ST39013 read as: -The OPS preferably shall be completely vapor tight to prevent fumes & vapor tight to prevent fumes & vapours from entering.
20. Clause 7.5(2c) at page no.: 12 of Spec-ST39013 read as: -Ignore the clause and consider vibration of machine in use is max vibration 9.0 mm/s.
21. Clause 8.1(f) at page no.: 13 of Spec-ST39013 read as: -Characteristic curve of all pumps preferably required.
22. Clause 8.1(i) at page no.: 4 of Spec-ST39013 read as: -Documents preferably required with offer-cross sectional drawings of all equipment including horizontal & vertical section of the separator.
23. Clause 8.3(b) at page no.:14 read as nine (9) sets paper based in place of twenty (20) sets of O&M Manual.
24. Refer sheet no 10 of specification ST 39013, clause no 4.2.g- alternatively vendor to ensure that separator cover is locked before starting the purifier.


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MANUAL CLEANING TYPE OIL PURIFIER (DCS BASED)

25. Clause j (i) at page no.: 12 of Spec-ST39013 read as – Degree of protection test as per IS: 2147 (type test) and HV test at 2.0 KV for one minute
26. For supply of VAF meter 3 phase 3 wire supply is preferred.
27. Refer sheet no 08 of 40 of specification ST 39013, clause no 4.1.u – cable glands suitable for 3 wire 400 mm² incoming cable shall be provided.
28. Refer Sheet no 8 of 40 of clause no 4.1.y., and sheet no 38 of 40 point no 2 of specification ST 39013 may be read as wherever possible Plug and socket type connection should be provided for pressure and level switch.
29. Refer sheet no 09 of 40 of specification ST 39013, clause no 4.2 – Alternatively switching of control unit shall be possible from DCS.
30. Refer sheet no 12 of 40 of specification ST 39013, clause no 7.h- Alternatively manufacturers test certificate shall be provided for BHEL review.
31. Refer sheet no 12 of 40 of specification ST 39013, clause no k.i – may be ignored.
32. Refer sheet no 12 of 40 of specification ST 39013, clause no k.ii – Pick up and drop-down test may be ignored. Alternatively, voltage variation range for all major items shall be indicated with items details in data sheet.
33. Refer sheet no 30 of 40 of specification ST 39013, clause no 16.1.8- starting current. This clause should be read as starting current shall be as per IEC 60034-12 or equivalent.
34. Refer sheet no 30 of 40 of specification ST 39013, clause no 17.1.g should be read as the pressure gauge should have micrometer adjustable facility on front or any other suitable place.
35. Refer sheet no 30 of 40 of specification ST 39013, clause no 17.1.i -This clause may be ignored.
36. Refer sheet no 30 of 40 of specification ST 39013, clause no 16.1.3-ambient temp may be read as 50 degree centigrade instead of 500.
37. Refer sheet no 31 of 40 of specification ST 39013, clause no 3.2 – should be read as motor should essentially have manual or online greasing facility.
38. Refer sheet no 33 of 40 of specification ST 39013, clause no 17.3- process connection of magnetic level switch shall be as per BHEL specification or vendors standard practice.
39. Motor starting current shall be for Direct Online (DOL) shall be as per IS: 12615 - 2011/IEC 60034.
40. For DCS based manual cleaning type oil purification system ON/OFF control, indication and alarm functions shall be provided on the LCP as well as on HMI system DCS.
41. Clause 4.1.e at page no.: 7 of Spec-ST39013 Requirement of flame proof motor as per IS2148 is not essential.
42. Clause 4.1.w at page no.: 8 of Spec-ST39013: - should be read as polishing filter, chock alarm shall be provided through DPS.
43. Motor efficiency: - IE3.
44. Spec. no. ST39013 Clause no. 17 (Page no. 33 of 40) Sl. No. 2:
Temperature Indicator

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MANUAL CLEANING TYPE OIL PURIFIER (DCS BASED)

- Type – Inert gas type instead of Bi-Metallic to be provided.
45. Incoming Supply: 415V AC, 3Phase, 4Wire.
46. MCCB Incomer: shall be 250Amps Incomer 4 pole ,3D,50kA, THERMAL MAGNETIC TM-D, SC PROTECTION MCCB
47. The MCCB shall be quick-make, quick-break heavy duty type min. 1NO + 1 NC auxiliary contacts. For Motor Protection, contactor, O/L relay and MCCB combination shall be tested to ensure type-2 co-ordination at 50KA rating.
48. MCB shall be rated for 10kA short circuit rating. It shall be quick make, quick break, independent manual type with trip free feature. MCB shall have the following:
- Over current protection
 - ON/OFF Trip position indicators
 - Auxiliary contact block (Wherever required)
49. Contactors shall be of air break, electromagnetic type rated for uninterrupted duty Contactors shall be double-break, non-gravity type and their main contacts shall be silver faced copper. Direct-on-line contactors shall be of utilization category AC3. Full Voltage Reversing starters shall comprise of Forward and Reverse contactors mechanically and electrically interlocked with each other. These contactors shall be of utilization category AC4.
50. The contactor shall operate satisfactorily between 85% to 110% of the rated voltage. The contactor shall not drop out at 70% of the rated voltage but shall definitely drop out at 20% of the rated voltage.
51. MCCBs shall be of four pole construction for panel mounting, operating mechanism shall be trip free, quick make quick break type. MCCB should be current limiting type only. The MCCBs shall be provided with front operating handles & mechanical ON/OFF indicators. MCCBs shall be provided with overload thermal releases setting range of 80% to 100% of rated current and adjustable short circuit magnetic releases from 5-10 times rated current.
52. **Current Transformer:** Metering CT Accuracy class shall be 0.5. The accuracy limit factor shall be less than 5.0.
53. The voltage transformers shall have an accuracy class 0.5 for metering & 3P for protection.
54. The local push button stations shall be dust and vermin proof and shall have a degree of protection of IP - 55. Push buttons shall be of heavy-duty spring return, push-to-actuate type. Their contacts shall be rated to make, continuously carry and break 10 A at 110V AC and 1A (inductive) at 220V DC.
55. **For Local Indicator (PG, TG etc.):**
- Dial size shall be 150mm.
 - Case Material: Stainless Steel
 - Enclosure Class: IP-65
56. **For Duplex RTD:**
- Head type: IP-65 universal screwed type.
 - Protecting Tube: -
 - O.D.: 8 mm
 - Material: SS-316, Seamless

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MANUAL CLEANING TYPE OIL PURIFIER (DCS BASED)

- iii. Filling: Magnesium oxide (Purity above 99.4%).
- iv. Calibration: DIN 43760
- v. Accuracy: 0.5%

57. For Level Switch:

- i. Switch housing: Epoxy coated die cast aluminium alloy with neoprene gasket conforming to IP-65.
- ii. Type of switch Configuration: 2 SPDT (two nos.)
- iii. Contact rating: 5A, 240V/AC, 0.25A, 220V DC

58. For Pressure Switch:

- i. Sensing element material: AISI SS-316. All other wetted part SS316.
- ii. Case Material: Die cast aluminium alloy with neoprene gasket.
- iii. Switch configuration: Two SPDT
- iv. Switch Rating: 240V, 5A AC/220V, 0.5A DC
- v. Enclosure Class: IP-65

59. Air Filter Regulator:

- i. Filter Element: Sintered Bronze
- ii. Filter Size: 5 microns
- iii. Input Air: 10.0 Kg/Sq. cm (maximum)
- iv. Output: Adjustable from 0-2.0 Kg / Sq. cm or 0-7.0 Kg / Sq. cm (continuous) as applicable.
- v. Effect of Supply: Maximum 0.02 Kg/Sq. cm for a change pressure variation in supply pressure of 4 Kg/Sq. cm
- vi. Bowl Material: Metallic.
- vii. Accessories: 2" dial size output pressure gauge
- viii. Feature: No perceptible drop of pressure on opening the drain port.


60. For Solenoid valve:

- i. Body: SS Bar Stock
- ii. Trim: AISI SS-316
- iii. Manual Operator: In built
- iv. Coil Enclosure: Stainless Steel
- v. Insulation: Class - H
- vi. Coil Casing: IP-65

61. Panels / enclosure shall be provided with 20% spare terminals. In addition, the spare hot on rail mounted input output channels /modules shall be in fully wired & terminated condition for system cabinets.

62. Vendor to provide additional packing list for Material code: W90318103613 as per Doc. no. 418101H3008


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(CIE)


Anil Kumar/Dy. Mgr
(STE-TL)

Check list for C&I items- OPU (DCS Based)

Indent No.:

Project Name:

S.No.	Description	Check
1.	OPU is DCS Based with provision of operating from local controls panel as well control room	Yes / No
2.	Plug and socket type connection for all pressure switch and level switch	Yes / No
3.	DCS/Local selector switch is provided on the Local control panel	Yes / No
4.	Relays shall be of 24 v dc and of vendor scope of supply	Yes / No
5.	List of drives to be operated through DCS is furnished along with list of instruments and alarms	Yes / No
6.	All field instruments shall be wired to a JB which shall be in vendor scope	Yes / No
7.	A pressure switch at outlet of centrifuge and a level switch in anti-flood tank shall be provided for detection of liquid seal breakage	Yes / No
8.	Arrangement for Liquid seal breakage alarm is provided	Yes / No
9.	Air requirement Of pneumatic valves is mentioned	Yes / No
10.	Motor efficiency meeting as per special instruction/project requirement	Yes / No
11.	Control panel is designed for 3 phase (415 v Ac) 4 wire power supply system	Yes / No
12.	Control panel is provided with anti-vibration pads to withstand vibrations	Yes / No
13.	Motor data sheet shall be subject to customer/ BHEL approval	Yes / No
14.	Cable glands for 415 V AC incomer is provided	Yes / No
15.	On/Off control, indication and alarms is provided in local panel as well as HMI	Yes / No
16.	Painting treatment as per addendum or special instruction mentioned in indent	Yes / No
17.	Construction of panel as per specification/addendum	Yes / No
18.	Price break of spare item/spare of LS switchgear given along with offer	Yes / No
19.	20% spare terminals have been provided at panel	Yes / No
20.	All instrument as well as motor data sheet, wiring diagram write up is subject to BHEL/customer approval	Yes / No
21.	Panel to be designed for 110 V AC control voltage	Yes / No
22.	Panel color as per specification/addendum	Yes / No
23.	LT motors shall be energy efficient type with efficiency class-3	Yes / No

Date:

Signature

Place:

Seal of manufacturer



SPARE FOR OPU CONTROL PANEL
ALL ADANI PROJECTS

DOC. NO.- 418101H3008
REV-00

PAGE NO.- 01 OF 02

BHEL MATERIAL CODE :W90318103613

SCOPE OF THE DOCUMENT-

1. Document covers the requirement of Spares of Control panel used in OPU, for 2X800 MW Kawai Ph II , 2X800 MW Kawai Ph III, 2X800 MW Mahan Ph-III MW Raigarh, 2X800 MW Raipur, 2X800 MW Mirzapur , 2X800 MW Mahan Ph-II
2. Offer with item wise price to be submitted by Vendor as per item list as tabulated at sheet no. 2.
3. Vendor to confirm that the spares match and interchangeable with items supplied in the main package (tabulated at sheet no. 2) without any additional requirement at site.
4. Three(3) copies of Test Certificates and Guarantee Certificates in English shall be furnished.
5. The equipment shall be Guaranteed for as per the main supply.
6. Each package shall be marked with the following
 - a. BHEL Order Number
 - b. Component name with Part Number
 - c. Supplier Name and reference
 - d. Net Weight/ Gross Weight
 - e. Project Name

The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED.
It must not be used directly or indirectly in anyway detrimental to the interest of the company.

Ref. Drg. No.

Sign & Date

Inventory No.

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indirectly in any way detrimental to the interest of the company.

DEPT CODE		NAME	SIGN	DATE
M	PRPD	SUNIL GAUTAM	S/D	24.01.25
	CHKD	DEEPAK GOYAL	S/D	24.01.25
	APPD	SURESH CHANDRA	S/D	24.01.25

SPARE FOR OPU CONTROL PANEL


Projects: 2X800 MW Kawai Ph II , 2X800 MW Kawai Ph III and 2X800 MW Mahan Ph-III, 2X800 MW Raigarh, 2X800 MW Raipur, 2X800 MW Mirzapur , 2X800 MW Mahan Ph-II

List of items (In 1 Set of Material code): -

MATERIAL CODE:- W90318103613

Sl. No.	Description	Make/Model and technical requirement	Qty (No.)
1	POWER CONTACTOR 9 AMP	Same as installed in Main supply	01
2	POWER CONTACTOR 25 AMP	Same as installed in Main supply	01
3	POWER CONTACTOR 40 AMP	Same as installed in Main supply	01
4	POWER CONTACTOR 80AMP	Same as installed in Main supply	01
5	AUX CONTACTOR	Same as installed in Main supply	01
6	TIMER	Same as installed in Main supply	01
7	RELAY24V 2COC	Same as installed in Main supply	02
8	RELAY 24V 4COC	Same as installed in Main supply	01
9	RELAY 110V 2COC	Same as installed in Main supply	02
10	RELAY 110V 4COC	Same as installed in Main supply	01
11	MPCB 13-18 AMP	Same as installed in Main supply	01
12	MPCB 4-6.3 AMP	Same as installed in Main supply	01
13	Current Transformer	Same as installed in Main supply	01

00	24.01.2025	418101H3008	SUNIL GAUTAM	DEEPAK GOYAL	SURESH CHANDRA
Rev	Date	Doc. No.	Prepared By	Checked By	Approved By

	PRE-QUALIFICATION REQUIREMENT(PQR) OF OIL PURIFICATION SYSTEM (OPS)		DOCUMENT NO.	
	BHARAT HEAVY ELECTRICALS LIMITED, HARIDWAR		TL-BOI-OPS-PQR-046	
			Date of issue:	05.03.2025
			Rev. no.	00

Description

The oil purification system (OPS) is complete skid of purifier in which separator is main component used for removing particle impurities and moisture contents from turbine lube oil system. It is centrifuge type with manual cleaning system. The control panel is DCS/PLC based type.

The OPS should be very reliable and proven in design. The OPS inlet and outlet connection are connected to main lube oil tank. The OPS should be designed for achieving purities of oil in a single pass. It should work both as purifier and clarifier.

Scope of the document:

This document states the pre-qualification requirements (PQR) of Oil purification system (OPS). Vendors desirous of supplying the OPS equipment to BHEL are advised to read this document carefully and furnish required documentation.

Mandatory requirement for Pre-Qualification

1.0 Experience Requirement –

- Vendor/ its principle should have successfully designed, manufactured, tested & supplied Oil purification system (OPS) for turbine oil applications. Vendor should have supplied at least one (1) no. of OPS in one power plant in last seven (7) years (from the date of issuance of enquiry) satisfying the criteria mentioned in table-1

Table-1

Sl. no.	Product features	Details
1.	Type of Separator	Centrifuge type
2.	Oil grade	Lube oil (ISO VG-46) or equivalent higher grade
3.	Flow Capacity (single machine)	4000LPH or higher
4.	Particle Purity Level	Equal to or better than class -/15/12 as per ISO 4406 at the outlet of OPS
5.	Moisture content	Equal to or less than 500 ppm at the outlet of OPS
6.	Control Panel type	DCS/PLC based


- In case the vendor is a non-manufacturer/trader, valid authorization certificate from principal to be submitted for our reference

2.0 Submission of documents conforming to Clause no. 1 along with offer

Vendor shall furnish the following documents for minimum one oil purification system:

- Vendor to furnish copy of Un-Priced Purchase Orders executed for supply of at least one no. of OPS in one project in last seven (7) years (from the date of issuance of enquiry).

Worked by	ANIL KUMAR/DM-STE(TL) <i>Anil Kumar</i>	S.K. GAUTAM/DM -CIE <i>S.K. Gautam</i>
Checked	---	DEEPAK GOEL/SM-CIE <i>Deepak Goel</i>
Approved	ANUJ JAIN/SDGM-STE(TL) <i>Anuj Jain</i>	SURESH CHANDRA/SDGM-CIE <i>Suresh Chandra</i>
	STE-TL	CIE
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	PRE-QUALIFICATION REQUIREMENT(PQR) OF OIL PURIFICATION SYSTEM (OPS)		DOCUMENT NO.	
	BHARAT HEAVY ELECTRICALS LIMITED, HARIDWAR		TL-BOI-OPS-PQR-046	
			Date of issue:	05.03.2025
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- b) Vendor to furnish the performance test certificate of particle size of impurities and moisture contents for lube oil satisfying in clause-1.0.
- c) Against supply at sl. no 1.0 above, controls for supplied OPS shall have been realised in a DCS/PLC based control panel. PLC shall be kept in a JB along with associated control gear on skid. Vendor to submit control panel scheme for information.
- d) Vendor to provide make/ model/ data sheet of centrifuge motor for information.
- e) Vendor to furnish P&ID, GA drg. and data sheet of OPS.
- f) Vendor to furnish dispatch docs of OPS i.e. tax invoice/ inspection report /Lorry way bill for our information.

TABLE-2: To be submitted filled by Vendor along with offer

Sl. no	Description	Acceptance Criteria	Vendors response for Project Vendor to Tick applicable box.	Does Vendor meet PQR (Vendor to tick Yes or No)
1	Project name and project rating			
2	Purchase Order No. and PO Date			
3	Whether design, manufacturing, testing, supply was done by Vendor/its principle.	Yes	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
4	Whether Type of purifier is centrifuge	Yes	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
5	Whether oil grade is Lube oil (ISO VG-46) or equivalent higher grade	Yes	Oil Grade = (Vendor to fill)	Yes <input type="checkbox"/> No <input type="checkbox"/>
6	Whether flow capacity of OPS >= 4000LPH	Yes	Flow capacity =LPH (Vendor to fill)	Yes <input type="checkbox"/> No <input type="checkbox"/>
7	Whether particle purity of oil as per sl. no. 4 of table-1	Yes	particle purity = (Vendor to fill)	Yes <input type="checkbox"/> No <input type="checkbox"/>
8	Whether moisture purity of oil as per sl. no. 5 of table-1	Yes	moisture purity = (Vendor to fill)	Yes <input type="checkbox"/> No <input type="checkbox"/>
9	Whether Control Panel type is DCS/PLC based	Yes	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
10	Contact details, Telephone no's & Email id of End user		Vendor to fill	

Note: -

- a) BHEL reserves the right to verify the information submitted by Vendor. BHEL may visit the factory premises of the Vendor for verification and other purposes submission of false/ incorrect information shall lead to rejection of offer.
- b) BHEL reserves the right to ask for more pertinent information /documents / clarifications.
- c) Vendor shall provide this information to BHEL in a timely manner so that project schedule does not hamper.

Worked by	ANIL KUMAR/DM-STE(TL) <i>Anil Kumar 5/3/25</i>	S.K. GAUTAM/DM -CIE <i>S.K. Gautam 5/3/25</i>
Checked	---	DEEPAK GOEL/SM-CIE <i>Deepak Goel 5/3/25</i>
Approved	ANUJ JAIN/SDGM-STE(TL) <i>Anuj Jain 5/3/25</i>	SURESH CHANDRA/SDGM-CIE <i>Suresh Chandra 5/3/25</i>
	STE-TL	CIE

MANUFACTURING QUALITY PLAN										QAP NO.: QA/QP/OPU			
CUSTOMER : BHEL, Haridwar					P.O. NO. : -		REV. NO: 00		DATE : 12-12-23				
PROJECT : Oil Purification Unit					P.O. DATE : -		PAGE 1 OF 5						
PACKAGE : Oil Purification Unit					DOC. NO. : -								
PRODUCT :					BHEL SPEC. : ST 39013		Rev. 08						
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	D	AGENCY	REMARKS		
1.8 RAW MATERIALS & BOUGHT OUT ITEMS													
A. Centrifuge													
1	Centrifuge with Motor	Throughput / RPM	MA	Bench Test	Each Machine	DIN 55350-18-4.2.2	WG Data Sheet	T.C.	✓	P	V	V	
2	Material of Construction	Boat Bottom - SS Boat Top - SS Boat Spindle - SS Distributor - SS Impeller (Centrifugal Pump) : Gun Metal Centrifuge Frame : Cast Iron Centrifuge Hood : Selenium	MA	COC Review	100%	Std. as per approved Data Sheet	BHEL Approved Data sheet	COC	✓	P	V	V	
3	Boat Balancing	Balancing Test	MA	---	---	---	COC	COC	✓	P	V	V	
4	UT on Boat Spindle	NDT	MA	---	---	---	No Surface Defect	COC	✓	P	V	V	
B. Control Panel													
1	Dimension	MI	Measurement	100%	BHEL Appd Drawing	BHEL Appd Drawing	Mfg. T.C.	✓	P	V	V	IP 54 Enclosure	
LEGEND: M: MANUFACTURER, C: CUSTOMER, N: END USER, P: PERFORM W/ WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY), 2 FOR GWSIN & 3 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, V & V COLUMNS * FOR ITEMS MARKED * (TICK) IN COLUMN D, TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.						PREPARED BY		APPROVED BY		APPROVED BY			
VENDOR'S SIGNATURE & STAMP						BHEL QA SIGNATURE & STAMP							

Kamal Sehgal

Kamal Sehgal
Manager, QAX



MANUFACTURING QUALITY PLAN											CAP NO.: QA/SP/DPV	
CUSTOMER : BHEL, Hardwar					P.O. NO. :		REV. NO: 00		DATE: 12-12-23			
PROJECT :					P.O. DATE :		PAGE 2 OF 5					
Package : Oil Purification Unit					DOC. NO. :							
PRODUCT :					BHEL SPEC : ST 39013		Rev. 08					
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY M C N	REMARKS	
2		Interlock & sequential operation	MA	Simulation	100%	BHEL Appd Drawing	BHEL Appd Drawing	Mfg. T.C.	✓	P V V		
3		Insulation resistance	MA	Megger Test	100%	500VDC	More than 1M Ohm	Mfg. T.C.	✓	P V V		
4		HV Test & IR before & after HV	MI	HV Test	100%	2KV for 1 min.	No failure	Mfg. T.C.	✓	P V V		
5		Voltage variation test	MA		100%	10% Variance	No failure	Mfg. T.C.	✓	P V V		
6		SB of Material	MA	Visual	100%	GWGIN Dwg	GWGIN Dwg	Mfg. T.C.	✓	P V V		
C. Motor												
1	Feed Pump Motor	Routine Test	MA	Elec. Test	100%	IEC6034	IEC6034	T.C.	✓	P V V		
2		Type Test	MA	Elec. Test	Sample	IEC6034	IEC6034	T.C.	✓	P V V		
3	Separator Motor	Routine Test	MA	Elec. Test	100%	IEC6034	IEC6034	T.C.	✓	P V V		
4		Type Test	MA	Elec. Test	Sample	IEC6034	IEC6034	T.C.	✓	P V V		
D. Pump												
1	Feed Pump	Routine Test	MA	Capacity & Pn	100%	Mfg. Spec.	Mfg. Spec.	Mfg. T.C./ Conformity Cr.	✓	P V V		
E. Instruments												
1	Pressure Gauge	Performance & accuracy	MA	Measurement	100%	Mfg. Spec.	Mfg. Spec.	Mfg. T.C.	✓	P V V		
2	Pressure Switches	Performance & accuracy	MA	Measurement	100%	Mfg. Spec.	Mfg. Spec.	Mfg. T.C.	✓	P V V		
LEGEND: M- MANUFACTURER, C- CUSTOMER, & END USER, P- PERFORM, V- WITNESS, V- VERIFICATION. INDICATE 1 FOR BHEL QOS (OR BHEL NOMINATED INSPECTION AGENCY), 2 FOR GWGIN & 3 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, V & V COLUMNS. + FOR ITEMS MARKED + (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.					PREPARED BY		APPROVED BY		APPROVED BY			
					VENDOR'S SIGNATURE & STAMP		BHEL QA SIGNATURE & STAMP					

Kamal Sehgal

Kamal Sehgal
Manager, QAX



MANUFACTURING QUALITY PLAN											QAP NO.: QA/QP/OPU	
CUSTOMER : BHEL, Haridwar						P.O. NO. :		REV. NO: 06		DATE: 12-12-2019		
PROJECT :						P.O. DATE :		PAGE 3 OF 5				
Package : Oil Purification Unit						DOC. NO. :						
PRODUCT :						BHEL SPEC. : ST 39013		Rev. 06				
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY M C N	REMARKS	
F. Pipe												
1	Pipelines	Leakage	MA	Hyd. Test	100%	Approved Drg	No Leakage	I.R.	✓	P V V V		
2	Pipe Fittings	Leakage	MA	Hyd. Test	100%	Approved Drg	No Leakage	I.R.	✓	P V V V		
G. Valves												
1	Valves	Leak test for body & seat	MA	Hyd. Test	100%	Mfg. Spec.	No leakage	I.R.	✓	P V V V		
2	Strainer Y - Type	Leak test for body	MA	Hyd. Test	100%	Mfg. Spec.	No leakage	I.R.	✓	P V V V		
H. Polishing Filter												
1	Polishing Filter	Routine Test including Hydro Test	MA	Conformity Test	100%	Mfg. Spec.	BHEL Apprd Doc	TC	✓	P V V V		
J. HEATER												
1	Plates	Mech / Chem	MA	Visual & Dimensional	100%	Sst. as per Approved Drg	SS304	Mfg. T.C.	✓	P V V V		
2	Nozzle Pipes	Mech / Chem	MA	Visual & Dimensional	100%	Sst. as per Approved Drg	SS304	Mfg. T.C.	✓	P V V V		
3	Flanges	Mech / Chem	MA	Visual & Dimensional	100%	Sst. as per Approved Drg	SS304	Mfg. T.C.	✓	P V V V		
4	MOC Tubes	Mech / Chem	MA	Mech/Chem	100%	Sst. as per Approved Drg	SS304	Mfg. T.C.	✓	P V V V		
<p>LEGEND: M: MANUFACTURER, C: CUSTOMER, N: END USER, P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CODE FOR BHEL NOMINATED INSPECTION AGENCY, 2 FOR GWSIN & 3 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT / CHARACTERISTIC UNDER P, W & V COLUMNS. * FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.</p>												
PREPARED BY						APPROVED BY		APPROVED BY				
VENDOR'S SIGNATURE & STAMP						BHEL QA SIGNATURE & STAMP						

Kamal Sehgal

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Manager, QAX



SL NO		COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY				REMARKS
<div style="display: flex; justify-content: space-between;"> <div> <p>MANUFACTURING QUALITY PLAN</p> <p>CUSTOMER : BHEL, Hardwar</p> <p>PROJECT : Package : Oil Purification Unit PRODUCT :</p> </div> <div> <p>P.O. NO. : P.O. DATE : DOC. NO. : BHEL SPEC. : ST 39013 Rev. 08</p> </div> <div> <p>QAP NO. : QA/SP/OPU</p> <p>REV. NO: 00 DATE: 12-12-23</p> <p>PAGE 4 OF 5</p> </div> </div>															
2.0 MANUFACTURING															
1	Fabrication / Assembly	Overall Dimension	MA	Dimensional	100%	BHEL Approved Drgs.	BHEL Approved Drgs.	IR	✓	P	V	-			
2	Welding	DPT Test	MA	Visual	100%	BHEL Approved Drgs.	BHEL Approved Drgs.	IR	✓	P	V	-			
3	Leakage Test	Oil Leakage	CR	Visual	100%	BHEL Approved Drgs.	BHEL Approved Drgs.	IR	✓	P	V	V			
4	Element Elec. Test	Resistance, Insulation, Capacity, Voltage, HV Test.	CR	Resistance Test, Megger Test, High Voltage Test	100%	BHEL Approved Drgs.	BHEL Approved Drgs.	Mfg. T.C.	✓	P	V	V			
3.0 INPROCESS, FINAL INSPECTION & TESTING															
1	Dimension and general layout of system	Dimensions & layouts	MI	Measurement & visual check	100%	Approved dgs.	Approved dgs.	I.R.	✓	P	W	W			
2	Complete Skid	Bill of Material	MI	Visual	100%	QWISN Drg.	QWISN Drg.	I.R.	✓	P	W	W			
3	System interlocks, alarms & DOL starter function	Functioning of instruments	MA	Simulation	100%	Approved dgs.		IR	✓	P	W	W			
4	Mechanical run Test	Capacity / vibration, Noise level	MA	Measurement	100%	NCI 2550/Approved Data sheet.	1.5 mm/s BS dBA for each Unit/Approved Data sheet.	IR	✓	P	W	W			

LEGEND: M- MANUFACTURER, C- CUSTOMER, N- END USER, P- PERFORMANCE WITNESS, V- VERIFICATION. INDICATE 1 FOR BHEL, COS (OR BHEL) NOMINATED INSPECTION AGENCY, 2 FOR QWISN & 3 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT / CHARACTERISTIC UNDER P, W & V COLUMNS. + FOR ITEMS MARKED + (TRICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.

PREPARED BY

APPROVED BY

APPROVED BY

VENDOR'S SIGNATURE & STAMP

BHEL QA SIGNATURE & STAMP

Kamal Sehgal

Kamal Sehgal
Manager, QAX




MANUFACTURING QUALITY PLAN											QAP NO.: QA/QP/OPU	
CUSTOMER : BHEL, Haridwar					P.O. NO. :			REV. NO: 00		DATE: 12-12-23		
PROJECT : Oil Purification Unit					P.O. DATE :			PAGE 5 OF 5				
PACKAGE : Oil Purification Unit					DOC. NO. :							
PRODUCT :					BHEL SPEC. : ST 39013			Rev. 08				
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	+	AGENCY	REMARKS	
									D	M	C	N
4.0 PERFORMANCE TEST												
1	Performance	Moisture content in oil before & after separation	MA	Lab test	Sample Report	GWSN Procedure	Free Moisture in Clean oil < 0.05% from initial > 1.5%	TC	✓	P	W	W
2	Oil Purity	Particle size Inlet and Outlet	MA	Lab Test	Sample Report	GWSN Procedure	Particle size at outlet is 15/12 from initial 21/18	Type Test Report	✓	P	V	V
5.0 PRESERVATION & PACKING												
1	Painting, Cleaning, Packing & Marking		MA	Visual	100%	BHEL Specs.	BHEL Specs.	Quality Record	✓	P	-	-

Note:

- All Material of Construction shall be as per BHEL approved data sheet/GWSN purchase specification & bought out items shall be procured from BHEL agreed sources/approved data sheet.
- Accuracy/class of instruments shall be as per BHEL contract specification.
- UT shall be carried out for bowl spindle dia > or = 50mm, /2MHz frequency, 20mm/30mm normal beam probe shall be used. The back wall echo shall be set to 100% at sound area. Any defect echo exceeding 20% is not acceptable. Also at any area loss back wall echo upto 20% (back wall echo height = 80% of FSN or less) is not acceptable.
- Bowl balancing is carried out to reduce the vibrations (which are measured during final inspection in column N3)

LEGEND: M: MANUFACTURER, C: CUSTOMER, N: END USER, P: PERFORMA, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL COS (OR BHEL NOMINATED INSPECTION AGENCY), 2 FOR GWSN & 3 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. + FOR ITEMS MARKED + (TICK) IN COLUMN 'D'. TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.	PREPARED BY	APPROVED BY	APPROVED BY
	VENDOR'S SIGNATURE & STAMP 		

Kamal Sehgal
Manager, QAX

दिनांक एवं हस्ताक्षर SIGN & DATE				उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)		ST39013	
मासकी सूची संख्या को अधिकृत करना है SUPERSEDES INVENTORY NO.		BASED ON ST 22002				पृष्ठ 40 का 1 Page 1 of 40	
<p align="center"> Bid Specification For Turbine Oil Purification System (Centrifuge type) </p>							
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दिनांक एवं हस्ताक्षर SIGN & DATE		29/03/16					
मासकी सूची संख्या INVENTORY NO.		P-5538					
						नाम NAME	
						दिनांक एवं हस्ताक्षर SIGNATURE & DATE	
CIE		B. S. Rana		अनुवादक TRANSLATED BY			
QAX		S. K. Chauhan		निर्माणकर्ता WORKED BY		Anil Kumar 18.03.16	
TSX		DEEPAK		जांचकर्ता CHECKED BY		A. S. Rajput 18.03.16	
महामन विभाग AGREED DEPTT.		नाम NAME		पर्यवेक्षणकर्ता SUPERVISED BY		R. Panja 18-03-16	
SUPERSEDES		दिनांक एवं हस्ताक्षर DATE & SIGNATURE		स्वीकृति APPROVED : S. K. Baveja		Gr. NO. 8.20	
REV.NO.		08		निर्माण PREPARED : PED		जारी ISSUED : TSX	
Dt.		29.03.16				दिनांक DATE : 25.8.84	
CHANGE ADVICE NO.		STE-14-04		26.03.14			

<div>दिनांक एवं हस्ताक्षर SIGN & DATE</div>		<div>ST39013</div> <div>पृष्ठ 40 का 2</div> <div>Page 2 of 40</div>				
<div>सामग्री सूची संख्या INVENTORY NO</div>		<div>उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)</div>				
<div>सामग्री सूची संख्या को अपडेट करना है</div>		<div>LIST OF CONTENTS:</div> <div><div><div>1) INTENT OF SPECIFICATION</div><div>2) SCOPE OF SUPPLY</div><div>3) GENERAL TECHNICAL REQUIREMENTS</div><div>4) CONTROL & INSTRUMENTATION</div><div>5) PERFORMANCE REQUIREMENTS</div><div>6) GUARANTEES</div><div>7) QUALITY ASSURANCE, INSPECTION AND TESTING</div><div>8) DOCUMENTS, DATA AND DRAWINGS TO BE FURNISHED BY SUPPLIER</div><div>9) MATERIALS OF CONSTRUCTION</div><div>10) CODES AND STANDARDS</div><div>11) CLEANING, PROTECTION AND PAINTING</div><div>12) DESIGN CO-ORDINATION MEETING</div><div>13) LIST OF CROSS-REFERRED STANDARDS</div><div>14) ANNEXURE- I (PROPERTIES OF TURBINE OIL)</div><div>15) ANNEXURE- II (DATA SHEET OF TURBINE OIL SYSTEM)</div><div>16) ANNEXURE- III (SPECIFICATION OF MOTOR)</div><div>17) ANNEXURE- IV (SPECIFICATION OF INSTRUMENTS)</div><div>18) ANNEXURE- V (P&ID)</div><div>19) ANNEXURE- VI (QUALITY PLAN)</div><div>20) ANNEXURE- VII (CHECK LIST)</div></div><div><div>3</div><div>3</div><div>4</div><div>6</div><div>10</div><div>10</div><div>11</div><div>13</div><div>15</div><div>15</div><div>15</div><div>16</div><div>16</div><div>18</div><div>20</div><div>30</div><div>33</div><div>34</div><div>35</div><div>36</div></div></div>				
<div>सामग्री सूची संख्या INVENTORY NO</div>		<div>Rev. no.</div> <div>08</div>	<div>निर्माणकर्ता WORKED BY:</div> <div>जाँचकर्ता CHECKED BY:</div>	<div>Anil / Kavita</div> <div>A. S. Rajput / Devesh</div>	<div>Anil kumar Kavita</div> <div>Ashish Devesh</div>	<div>18.03.16</div> <div>18.03.16</div>



उत्पाद क्रय विनिर्देश (हीप : हरिद्वार)
PRODUCT PURCHASE SPECIFICATION
(HEEP: HARIDWAR)

दिनांक एवं हिमाक्षर
SIGN & DATE

SUPERSEDES
INVENTORY NO.

आमदी मूची संख्या को
अधिकृत करता है

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स्वत्वाधिकार एवं गोपनीय
रस प्रलेख में दी गई सूचना भारत हेतु गणकीकृतकालम लिमिटेड
प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग जो कि
हानिकारक हो न किया जाय।

SIGN & DATE

सामग्री सूची संख्या
INVENTOR V

This specification is intended to cover design, manufacturing, testing, delivery supervision of system & commissioning of turbine oil purification system and putting the system into satisfactory operation.

RESPONSIBILITY OF BIDDER: The bidder shall be responsible for providing all material, equipment and services, specified or otherwise which are required to complete the project and fulfill the intent of ensuring operability, maintainability and the reliability of the complete work covered under this specification. It is not the intent to specify completely here in, all aspects of design and construction of equipment. Nevertheless, the equipment shall conform in all respects to high standards of engineering, design & workmanship & shall be capable of performing in continuous commercial operation, in a manner acceptable to Purchaser/Owner. Bidder is requested to carefully examine and understand the specification & seek clarification, if required, to ensure that they have understood the specifications prior to submit the bid.

2 SCOPE OF SUPPLY

2.1 One oil purification system (OPS) shall comprise of:

- a. One centrifuge along with its drive & accessories.
- b. Indirect type oil heater and accessories
- c. One dirty oil feed pump complete with its drive & accessories.
- d. One clean oil discharge pump complete with its drive & accessories (if applicable).
- e. Polishing filter with suitable bypass arrangement.
- f. Adequately sized booster pump (if required).
- g. One overflow sight fitting (loose supply).
- h. The OPS shall be such that it can be used both as purifier as well as clarifier.
- i. An arrangement to detect and raise alarm in case of liquid seal breakage.
- j. All relevant valves, Y-type strainer, fittings and inter-connecting piping.
- k. All flanged end valves and flanged terminal points of piping along with counter flanges, nuts, bolts and gaskets.

Rev. no. 08

निर्माणकर्ता
WORKED BY

Anil / Kavita

Amil kumar
Kaur


18.03.16


जाँचकर्ता

A. S. Rajput /
Devesh

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DC

18.03.16

<div style="text-align: center;">  <p>उत्पाद क्रय विनिर्देश (हीप : हरिद्वार)</p> <p>PRODUCT PURCHASE SPECIFICATION</p> <p>(HEEP: HARIDWAR)</p> </div>	ST39013				
	<p>पृष्ठ 40 का 4</p> <p>Page 4 of 40</p>				
<div style="text-align: center;"> <p>समग्री सूची संख्या</p> <p>INVENTORY NO</p> </div>	<p>1. All relevant controls, interlocks and instrumentation.</p> <p>m. Foundation plates, anchor bolts, sleeves, inserts etc. required for installation of the complete system on foundation.</p> <p>n. Necessary lugs and eye bolts of all equipments for lifting the complete system during erection and maintenance.</p> <p>o. A set of required special tools and tackles for erection & commissioning and operation & maintenance of the system.</p> <p>2.2 Spare Parts: - Spares for satisfactory commissioning of the OPS are to be supplied (apart from mandatory spares). Also, a list of recommended spare parts with price break-up for 3 year satisfactory operation of the system shall also be supplied by vendor. Purchase order on the same shall be placed later by BHEL as per customer's requirement. Validity shall be kept suitable to meet our customer's requirement.</p> <p>3 GENERAL TECHNICAL REQUIREMENTS</p> <p>3.1 The OPS shall operate on a bypass system and the capacity of the unit shall as per the Table-A of this specification. The oil in system conforms to Servoprime-46 / ISO VG 46 / Turbinol-47 / BHEL standard practice (refer Annexure -I). The system will be located inside the turbine hall in oil room near oil tank.</p> <p>3.2 The OPS should be as compact as possible so that it may be installed in the minimum required space and easy to handle.</p> <p>3.3 The OPS should be suitably designed to operate in tropical climatic conditions. Equipment shall be designed for ambient temperature of 55°C and relative humidity of 95%.</p> <p>3.4 Base area/ foundation of purifier shall be designed to be as compact as possible without any vibration problem as per IS: 10816-2.Norms as per approved datasheet.</p> <p>3.5 All valves and instruments should be readily accessible to facilitate maintenance and operation.</p> <p>3.6 The OPS should be completely vapour tight to prevent fumes and vapours from entering.</p> <p>3.7 The equipment shall be suitable for continuous operation round the clock.</p> <p>3.8 On load automatic cleaning of bowl assembly is preferable.</p>				
<div style="text-align: center;"> <p>समग्री सूची संख्या</p> <p>INVENTORY NO</p> </div>	<div style="text-align: center;"> <p>Rev. no.</p> <p>08</p> </div>	<div style="text-align: center;"> <p>निर्माणकर्ता</p> <p>WORKED BY:</p> </div>	<div style="text-align: center;"> <p>Anil / Kavita</p> </div>	<div style="text-align: center;"> <p>Anil kumar</p> <p>Kavita</p> </div>	<div style="text-align: center;"> <p>18.03.16</p> </div>
		<div style="text-align: center;"> <p>जाँचकर्ता</p> <p>CHECKED BY:</p> </div>	<div style="text-align: center;"> <p>A. S. Rajput /</p> <p>Devesh</p> </div>	<div style="text-align: center;"> <p>A.S. Rajput</p> <p>Devesh</p> </div>	<div style="text-align: center;"> <p>18.03.16</p> </div>

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
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सामग्री सूची संख्या INVENTORY NO.	3.9 The OPS shall be equipped with sight glasses both for the purified oil and the separated water from the collecting pan. 3.10 Each purifier system shall be furnished with a positive displacement feed pump & a similar type discharge pump, if needed. Each pump shall be of the helical, herringbone, Spur gear or screw type with a normal capacity of at least 10% greater than that of the purifier system when operating under the maximum suction lift against the pressure required to feed the centrifuge. Each pump shall be fitted with adequate relief bypass valve to prevent damage from excess pressure. 3.11 Although oil temperature at the inlet to heater during normal operation of Turbine Generator set shall be 65°C but system should be designed to operate with oil at 20°C during cold starting of TG-set. During such operation, even if guaranteed purification cannot be achieved, the system shall be accepted. 3.12 Arrangement of oil recirculation piping/piping connection should be provided with recirculation line connecting to clean oil line at oil purifier outlet (with applicable NRVs) such that there are only two interfaces of oil inlet & outlet connection to oil purifier. 3.13 For two or more centrifuges running in parallel, a common skid housing for both or multiple centrifuges shall be supplied with inlet & outlet manifold. Connection interface with BHEL shall be inlet & outlet only, not multiple connections. 3.14 Pressure at the outlet of oil purification system shall be 1.5 to 2.0 bar (gauge). 3.15 The inlet, outlet & overflow connections to overflow sight fitting shall be NB80 (ø88.9X3.96)/NB40 (ø48.3X3.96)/NB15 (ø21.3X2.6) respectively. Also, it is to be noted that overflow sight fitting is to be supplied loose and the same shall be fitted in BHEL's Main Oil Tank at site. 3.16 A common drive system for separator, dirty oil feed pump and clean oil discharge pump (if required) shall also be considered. Details of such drive should be clearly submitted by the vendor in his offer. 3.17 Different variants for combination of Flow capacity of Oil Purification System, Control Panel Type and Heater Rating are given below in Table- A.			
सामग्री सूची संख्या INVENTORY NO.	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	18.03.16
सामग्री सूची संख्या INVENTORY NO.	Rev. no. 08	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	18.03.16


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			पृष्ठ 40 का 6
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TABLE- A



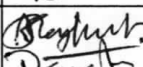
Var. No.	Flow capacity of purification system (Litre Per Hour)	Control Panel Type	Heater Rating (kW)
1.	7500	DCS	90 kW
2.	6000	DCS	72 kW
3.	2 x 4500	DCS	120 kW
4.	7500	Relay	90 kW
5.	6000	Relay	72 kW
6.	2 x 4500	Relay	120 kW
7.	7500	DCS	55 kW
8.	6000	DCS	45 kW
9.	2 x 4500	DCS	80 kW
10.	7500	Relay	55 kW
11.	6000	Relay	45 kW
12.	2 x 4500	Relay	80 kW


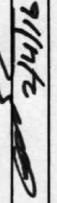
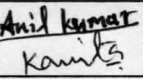
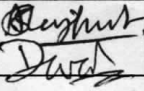
4 CONTROL AND INSTRUMENTATION


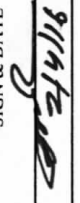
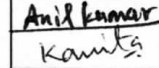
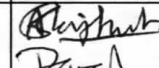
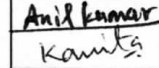
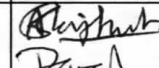
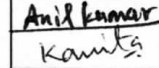
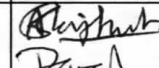
4.1 Offer should include all necessary interlocks & instruments along with remote indication facility in the control panel (protection type). Purchaser will review same & necessary addition / subtraction in interlocks & instruments, considered essential for smooth operation of the unit, will be asked to include. Some of the important interlocks/controls, required, are given below.



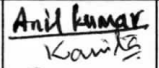
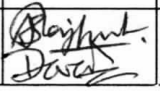
- Separator shall be provided with interlocks to prevent the operation of the unit unless the feed pump & the discharge pump are operating.
- A system of annunciating the flooding of the separator due to loss of water seal shall be provided.
- All instruments i.e. pressure gauges, RTDs etc. should be reliable & of proven design. Purchaser has full right to ask them changed from one supply source to another according to operational experience. All instruments should be calibrated at minimum 5 points throughout the range and accuracy, hysteresis, repeatability etc. shall be within the specified limits i.e. $\pm 1\%$.
- Auxiliary electric supply available at site comprises of 415V, 3 ϕ , 3 wires, 50 Hz ($\pm 10\%$ V, $\pm 5\%$ frequency, $\pm 10\%$ combined). If supplier requires any other supply for his devices, instruments and drives etc. he shall arrange \ to convert 415V, 3 ϕ supply to the required value for further distribution. Isolating switches, over current protection, fuses, junction boxes with terminal strips etc. as required for sub-distribution shall be deemed to be in bidder's scope.

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सामग्री सूची संख्या INVENTORY NO.	(e) Motor shall be flame proof as per IS: 2148 and make shall be of BHEL approved vendor make. Motor shall be preferably of class 2 or better in efficiency rating. If motor of any other efficiency is required, the same will be intimated to vendor during enquiry. Technical requirement for motor is given in Annexure-III.			
SUPERSEDES INVENTORY NO.	(f) The temperature of the oil leaving the heater shall be automatically controlled by RTD in not less than 3 steps. RTD shall function to open the heater circuits when the desired temperature is exceeded & to close the heater circuits before the temperature drops below that necessary for proper purification of the oil. The heater circuits shall be interlocked with the pump motor circuits to shut off the heaters when the pumps are not being operated. Heater rating should be as given in Table-A. Heaters shall be designed to operate in minimum of three steps & shall be of indirect type.			
सामग्री सूची संख्या को अधिकृतित करना है	(g) In case of polishing filter, it shall be equipped with a differential pressure switch with adjustable contracts to indicate high pressure drop across the filter along with alarm & annunciation system.			
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	(h) Local instruments for pressure temp. & flow indication shall be provided in accordance with clause 8.0 of Annexure-I.			
स्वत्वधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारती भारतीभारत भारतीभारत भारतीभारत की संपत्ति है। इसका प्रयोग एवं प्रसारण केवल ही इस दस्तावेज के लिए ही किया जा सकता है। (This document contains confidential information and its use is restricted to the purpose for which it is issued.)	(i) The unit should be provided with suitable alarm & annunciation system for easy operation & identification of fault conditions. It should have spare outputs in the form of potential free contact to be hooked-up with central annunciation system in the room.			
निष्काप एवं हस्ताक्षर SIGN & DATE	(j) All control switches, indicating lamps & sound alarm devices shall be mounted on the front face plate of a cubicle (panel) to be supplied with purification unit.			
सामग्री सूची संख्या INVENTORY NO.	(k) Remote operating facility for all electrically operated components should be provided on control panel.			
Rev. no.	(l) All motors, heaters included in the offer, should be supplied along with its starter which will be mounted in the same panel.			
08	(m) An arrangement to detect and raise alarm in case of liquid seal breakage shall be provided. It may be adequately sized anti-flood tank with necessary drain valves along with level gauge or any other equivalent arrangement as per standard practice of the vendor. Drain and vent connections for level switch specified in Annexure-III to ST39013 shall be NB15 (ø21.3X2.6).			
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SUPERSEDES INVENTORY NO. सामग्री सूची संख्या को अधिकृतित करना है	<p>(o) If a common control panel is provided by vendor for two or more oil purifiers running in parallel, then control panel should be designed in such a way that it allows control of both the separators on the same panel. Control panel & controls shall also be able to work a purifier satisfactorily while one purifier is in shutdown/ breakdown.</p> <p>(p) Local Panel (LCP) construction: Type: Fabricated from cold rolled sheet steel Frame thickness: 2.0 mm Enclosure thickness: 1.6 mm Gland plate thickness: 3.0 mm</p> <p>(q) ON/OFF control, indication, and alarm functions shall be provided on the LCP as well as on HMI system (DCS).</p> <p>(r) Adequately sized copper ground bus shall be provided for each panel.</p> <p>(s) Control voltage shall be 110 V AC/220 VAC. This will be informed at the time of detail Engineering.</p> <p>(t) Cables for Motors and heaters shall be adequately sized keeping sufficient margin. Sizes shall be subject to BHEL/Customer approval.</p> <p>(u) Cable glands suitable for incoming 415 V feeder cables shall be provided. Cable Sizes will be intimated later.</p> <p>(v) LCP shall have 20% spare terminals.</p> <p>(w) Polishing filter (if applicable), chock alarm shall be provided through DPS.</p> <p>(x) All instruments/ Devices shall have IP55 degree of protection.</p> <p>(y) For level switches and other instruments, plug and socket type connectors shall be provided. For level switch over range proof pressure shall be 150% of max design pressure.</p> <p>(z) For Pressure gauge, Temperature gauge and level gauge over range test pressure shall be 1.5 times the maximum design pressure at 38 C. Range selection should cover 125% of max of scale. For Rotameter, the housing shall be IP55 protection class.</p> <p>(aa) Reports of type tests shall be those conducted within last five years.</p>					
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स्वामित्व अधिकार एवं गोपनीयता इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स लिमिटेड की सम्पत्ति है इसका प्रयोग एवं अवलोकन केवल केवल के लिए ही किया जाना है।						
दिनांक एवं हस्ताक्षर SIGN & DATE						
सामग्री सूची संख्या INVENTORY NO.	Rev. no. 08		निर्माणकर्ता WORKED BY:	Anil / Kavita		18.03.16
			जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh		18.03.16

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सामग्री सूची संख्या को अधिनिर्दिष्ट करना है SUPERSEDES INVENTORY NO.	<p>(bb) The local control panel shall have main switch fuse unit, power contactors, control transformer, space heater, alarm lamps, terminals, switchgear, OLR for separator motors and heaters and other contactors.</p> <p>(cc) Interconnection diagram shall be provided along with offer.</p> <p>(dd) Anti vibration pads shall be provided. Control panel should also be designed in such a way that it is able to withstand the site vibrations.</p> <p>(ee) Instruments/ equipments used in parallel system of 2x4500LPH system shall be of same make & type for both the purifiers in a single project.</p>										
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	<p>4.2 For DCS control panel, additional requirements</p> <p>The purification system shall be operated from control room as well as local panel having the logic built in BHEL control system instead of relay based control system.</p> <p>It shall also have Local/remote switch, separator start/stop selector Switch, heater on/off sel. Switch Test/Accept/Reset push buttons and 24 V DC interfacing relays with DCS.</p> <p>Control Philosophy</p> <p>(a) The purification system shall be operated from control room, as well as local control panel "DCS/Local" selector switch shall be provided on the LCP.</p> <p>(b) All field instruments shall be wired to a JB, which shall be in vendor scope. From JB these shall be wired to DCS by BHEL.</p> <p>(c) Operating sequence and interlocks for various drives shall be programmed in BHEL's DCS. Vendor shall furnish Logic diagram and write-up for operation of the system. All interlocks shall be clearly brought out in the logic diagram and write-up.</p> <p>(d) 24V Interfacing relay are to be supplied by vendor mounted in the LCP for operation of drives. 24V commands shall be given from DCS to these relays for operation of various drives.</p> <p>(e) Alarms shall be generated in DCS and output shall be given for driving the alarm windows in LCP.</p> <p>(f) Control of individual heaters stages shall be from DCS for maintaining required oil temp using 2 nos. duplex RTDs.</p>										
स्वामित्व अधिकार एवं गोपनीयता इस दस्तावेज़ में दी गई सूचना भारत भारती लिमिटेड की सम्पत्ति है इसका प्रयोग एवं आचरण केवल उसी की राय पर ही किया जाना चाहिए।											
दिनांक एवं हस्ताक्षर SIGN & DATE											
सामग्री सूची संख्या INVENTORY NO.	Rev. no. 08		<table border="1"> <tr> <td>निर्माणकर्ता WORKED BY:</td> <td>Anil / Kavita</td> <td></td> <td>18.03.16</td> </tr> <tr> <td>जाँचकर्ता CHECKED BY:</td> <td>A. S. Rajput / Devesh</td> <td></td> <td>18.03.16</td> </tr> </table>	निर्माणकर्ता WORKED BY:	Anil / Kavita		18.03.16	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh		18.03.16
निर्माणकर्ता WORKED BY:	Anil / Kavita		18.03.16								
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सामग्री सूची संख्या को अधिकृत किया गया है	SUPERSEDES INVENTORY NO.	<p>(g) Limit switch or any other alternate arrangement with BHEL approval shall be provided for separator cover for remote monitoring when operating in DCS.</p> <p>(h) Flow switch shall be provided at centrifuge inlet.</p> <p>(i) List of drives to be operated from DCS, list of instruments and list of alarms shall be furnished along with the offer.</p> <p>(j) Air requirement for 3-way valve shall be furnished with the offer.</p> <p>(k) Functional testing of system shall be done with local control panel and by simulating DCS outputs.</p>		
<p>5 PERFORMANCE REQUIREMENTS</p> <p>a. The quality of purified oil at outlet of OPS at 65°C shall be as follows.</p> <p>(i) Particle size of impurities at the outlet of OPS shall be equal to or better than class 15/12 as per ISO 4406 from class 21/18 at the inlet of the oil purification system in single pass without removing any additives/ inhibitors present in the oil and maintaining the lubricating value of the oil.</p> <p>(ii) Moisture contents at the outlet of OPS shall be maximum 300 to 500 ppm from inlet of maximum 15000 ppm.</p> <p>b. Polishing filter shall be capable of handling the quantity of clean oil, coming out of the centrifuge & filtering it down to $\beta_3=1000$ or better including colloidal carbon but shall not remove any rust inhibitor or oxidation inhibitor.</p> <p>c. Noise level shall not exceed 85 decibel measured at a distance of 1 meter from the equipment and at height of 1.5 meter from the ground level.</p> <p>d. Facility of indirect heater for heating oil from 50°C to the temperature which is required to make separation of water and oil most effective shall be provided. But to take care of situation while temperature is much below than 50°C, an arrangement of utilizing the heater to elevate the temperature of oil in the main oil tank to 50°C shall be provided. Heater shall be provided with suitable bypass arrangement.</p>				
<p>6 GUARANTEES</p> <p>6.1 The unit should be guaranteed for trouble free operation for a minimum period of 18 months after commissioning or 36 months after dispatch whichever is earlier.</p>				
निष्कर्ष एवं हस्ताक्षर SIGN & DATE 	सामग्री सूची संख्या INVENTORY NO. P-5538	Rev. no. 08	निर्माणकर्ता WORKED BY: Anil / Kavita	 18.03.16
		जाँचकर्ता CHECKED BY: A. S. Rajput / Devesh	 18.03.16	


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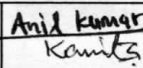
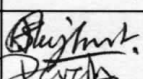
स्वतंत्रता एवं गोपनीय

इस प्रलेख में दी गई सूचना भारत की गणराज्य के सिविल सेवा नियमों के अंतर्गत है। इस सूचना को बिना अनुमति के किसी भी तरह प्रयोग, जो कि कंपनी के हित में प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाय।

विनाम एवं दिनांक SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
			पृष्ठ 40 का 11 Page 11 of 40	
सामग्री सूची संख्या INVENTORY NO.	6.2 The purification level as indicated in clause 5.2 shall be guaranteed by the supplier. 6.3 The supplier shall guarantee the power consumption of the motor at normal duty point. 6.4 If during erection, commissioning and operation at site any deficiency in a part is detected within the guarantee period, BHEL site representative shall prepare the assessment report and a copy of the same shall be forwarded to the supplier. The supplier shall replace/ rectify the concerned items free of charge. The supplier if, he so desires may depute his representative at site at his own cost, otherwise the finding of BHEL/ Owner representative shall be final and binding on the supplier. 6.5 Care should be taken during packing of electrical/electronic items to insure that there is no damage to these items during handling/transportation.			
सामग्री सूची संख्या को अधिकृतित करना है	7 QUALITY ASSURANCE, INSPECTION AND TESTING 7.1 The manufacture shall conduct all tests required to ensure all the component parts of the oil purification unit offered conform to the requirements of the specification & in compliance with requirements of applicable codes & standards. 7.2 The bidder shall submit along with his offer quality plan in the prescribed BHEL's format as per Annexure-VI. 7.3 The particulars of the proposed shop tests & procedures for the tests shall be submitted to the BHEL / owner for approval along with quality plan. 7.4 The equipments shall be dispatched only after inspection & clearance of material by BHEL/ Owner & approval of tests certificates by BHEL /Owner. 7.5 The minimum tests / checks to be carried out on the unit as envisaged by purchaser are given below. This is however , not intended to form a comprehensive testing programme as it is supplier's responsibility to prepare the detailed quality plan, which should also include tests checks carried out by supplier as a part of their normal practice. This quality plan is subjected to the approval of BHEL & owner. BHEL/ Owner reserves the right to ask any more checks at the time of quality plan finalization. (1) <u>TESTING OF MATERIALS</u> : The material of each component that is bowl, bowl cover, disc, heater tubes, pump casing Shafts, gear/screw, valve body etc. shall be tested as per relevant specification for its composition & mechanical properties, viz. YS, UTS, impact strength, % elongation, % RA etc. suitable NDT on the above components to ensure freedom from surface & subsurface defects shall be carried out. (2) Following tests shall be carried out during various stages of manufacture at manufacture's works.			
विनाम एवं दिनांक SIGN & DATE	स्वत्वधिकार एवं गोपनीयता The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.			
सामग्री सूची संख्या INVENTORY NO.	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita Anil Kumar Kamits	18.03.16
सामग्री सूची संख्या INVENTORY NO.	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	A. S. Rajput / Devesh	18.03.16

निष्कर्ष एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
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सामग्री सूची संख्या INVENTORY NO.	(a) Check for dimensions of all the component parts including surface finish, radial run out of shaft (b) <u>NDT</u> :- Bowls shall be subjected to DP after final machining to ensure freedom from surface defects. Shaft shall be subjected to UT & DP to ensure freedom from internal & surface defects. All butt welds on oil piping shall be subjected to 10% RT & fillet welds to 100% MP/DP. Norms for acceptance to be informed in the offer for BHEL approval. (c) Static & dynamic balancing test on all rotating elements of the centrifuge. Acceptance Norms for vibration is 5.6 mm/s. (d) Hydraulic testing of all pressure parts including polishing filter if offered and vessel body etc. for 1.5 times of working pressure for 30 minutes & seat leakage test of valves at 1.0 times of working pressure for 30 minutes. No leakage to be ensured. (e) Performance test on feed & discharge oil pump, purifier motor, heaters, control system & other accessories. Reference & Acceptance norms for vibration to be informed in the offer for BHEL approval. (f) Type-test reports detailing the results for motors of similar ratings shall be furnished as called annexure III. (g) Routine test reports of motors to be furnished as per annexure III. (h) Control panel RTD, level switch & solenoid valve shall be subjected to the following final testing as applicable as routine test (unless otherwise stated) in addition to the stage inspection carried out by the vendor. (i) Dimensional checks as per approved drawing including proper cut outs, mounting of all instruments/ accessories etc. as per approved general arrangement drawing. (j) Functional/ operational checks of all wiring schematics, operational/ sequential interlocks etc. are applicable as per approved drawing. i) Degree of protection test as per IS: 2147 (Type test) at 2.0 KV. ii) Pick up and drop down test & performance with $\pm 10\%$ voltage variation. (l) Capacity test of complete oil purification system. During capacity test, the complete purifier shall be tested at manufacture's works for mechanical running, vibration & noise level, sequential operation & interlocks, test for vapour tightness (if applicable), maximum particle size & moisture			
सामग्री सूची संख्या INVENTORY NO.	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	18.03.16
सामग्री सूची संख्या INVENTORY NO.	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	18.03.16	18.03.16

निष्काप एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
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निष्काप एवं हस्ताक्षर SIGN & DATE	SUPERSEDES INVENTORY NO.	i. Cross-sectional drawings of all equipments including horizontal and vertical section of separator indicating the recommended and mandatory spare parts. Also, list of recommended and mandatory spares with their part no. / model no. and quantity required. j. Details of standards /codes used for designing of the various equipments and selecting the material of various components. k. Name of the manufacturer and illustrative literature all components which have been out-sourced for purchaser's review. l. All other relevant data and drawings which supplier considers necessary for better understanding of the system. m. Type test Reports for capacity, moisture content, particle size of impurities and motor efficiency conducted within last 5 years. n. Interconnecting diagram of DCS control panel (if required). o. Acceptance norms for (i) in process NDT of bowl, shaft, butt welds of piping. (ii) Static & dynamic balancing of shaft. (iii) Performance test on pumps & motors. (iv)Vibration norms for pumps, motor and unit. p. Also, Bidder to shall furnish the filled up check list of BHEL format as per annexure –VII.		
8.2 DRAWINGS / DOCUMENTS REQUIRED WITHIN 30 DAYS AFTER PLACEMENT OF ORDER				
a. Five sets (paper based) of each of GA drawing, P&ID, filled in data sheet, control panel schematic & write-up etc. shall be furnished for review/ approval by BHEL/CUSTOMER after placement of order. b. Motor datasheet, curves/ graphs, type- test reports, efficiency rating etc. for review/ approval by BHEL/CUSTOMER after placement of order. c. O & M manual (soft/ paper based) shall be furnished for BHEL review/ approval.				
8.3 DRAWINGS/ DOCUMENTS REQUIRED ALONGWITH SUPPLY				
a. All relevant test certificates & full details of the tests carried out as per the requirement of this specification before dispatch. b. Twenty sets (paper based) and 2 set (in CDROM) of O&M manual shall be furnished containing all drawings and datasheets, catalogues of all instruments and instructions for storage, erection &				
निष्काप एवं हस्ताक्षर SIGN & DATE	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	18.03.16
निष्काप एवं हस्ताक्षर SIGN & DATE	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	18.03.16	18.03.16



दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013 पृष्ठ 40 का 15 Page 15 of 40																
सामग्री सूची संख्या INVENTORY NO.	commissioning, operation and maintenance after approval. Vendor shall keep 2 copies of O&M manual in the dispatch box & shall also mention the same in its shipping list.																		
सामग्री सूची संख्या को अधिकृतित करना है	c. Before bidder finalises these manuals, the same will be reviewed by purchaser. After getting approval of purchaser, final manual in required quality shall be dispatched. Manual shall clearly indicate all inspections & tests to be carried out at site and if any check list/ log sheets etc. are required to carry-out specified inspection & test that shall be made part of manual.																		
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	d. Data sheets of all instruments, thermostats and motor .The same shall be included in O&M manual of oil purification system along with the catalogues of all instruments.																		
स्वामित्व अधिकार एवं गोपनीय इस दस्तावेज में की गई सूचना भारत भारती लिमिटेड का संपत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह का उपयोग जो कि कंपनी के हित में होतिकाक हो न किया जाय।	9 MATERIALS OF CONSTRUCTION 9.1 The material of all rotating parts / components i.e. "bowl, bowl cover, disc, Shaft/spindle, gear/screw shall be of high grade stainless steel (e.g. austenitic) considering the purpose and the extent of contact with oil. Other parts coming in direct contact with water shall be of stainless steel or other corrosion resistant material conforming to applicable standard (IS / BS) or equivalent standard. All those parts that are coming in contact with oil & are not of Stainless steel / other corrosion resistant shall be mentioned in their offer. This should be submitted as a separate document indicating material/ make of all parts. 9.2 All piping, fittings & valves should be suitably selected as per applicable IS, BS or equivalent standard. 9.3 Strainers, wherever provided, should be designed to enable them to be cleaned during operation. 9.4 All other parts/ components shall be of compatible material to suit the applications.																		
दिनांक एवं हस्ताक्षर SIGN & DATE	10 CODES AND STANDARDS In addition to the codes and standards specifically mentioned in the relevant technical specification for the equipment/ plant/ system, all equipment parts, systems and works covered under this specification shall comply with all currently applicable statutory regulations and safety codes (National/International).																		
दिनांक एवं हस्ताक्षर SIGN & DATE	11 CLEANING, PROTECTION AND PAINTING Painting scheme shall be according to BHEL approved/ previously approved scheme. Painting scheme for oil purification system shall be as below.																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Paint (Coat)</th> <th style="width: 45%;">Paint Type</th> <th style="width: 15%;">No. of coat</th> <th style="width: 15%;">DFT*</th> </tr> </thead> <tbody> <tr> <td>Primer Paint:</td> <td>Epoxy base Zinc rich primer paint</td> <td style="text-align: center;">2</td> <td style="text-align: center;">70</td> </tr> <tr> <td>Intermediate Paint:</td> <td>Epoxy TiO2 Pigmented Polyamide Cured Paint</td> <td style="text-align: center;">1</td> <td style="text-align: center;">70</td> </tr> <tr> <td>Finish (Final) Paint:</td> <td>Aliphatic Acrylic 2 Pack Polyurethane Finish paint</td> <td style="text-align: center;">2</td> <td style="text-align: center;">60</td> </tr> </tbody> </table>				Paint (Coat)	Paint Type	No. of coat	DFT*	Primer Paint:	Epoxy base Zinc rich primer paint	2	70	Intermediate Paint:	Epoxy TiO2 Pigmented Polyamide Cured Paint	1	70	Finish (Final) Paint:	Aliphatic Acrylic 2 Pack Polyurethane Finish paint	2	60
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सामग्री सूची संख्या INVENTORY NO.	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh 	18.03.16 18.03.16																


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Total Minimum DFT= 180 *DFT– Dry Film Thickness (Final) in micron.	
Paint Shade shall be as below:- <ul style="list-style-type: none">For Oil purifier- Light Blue (RAL 5012)For Control Panel generally it is - External-Light Grey (shade 631 of IS-5), Internal- Brilliant White or paint shade will be informed during later stage of engineering.	
11.1 All surfaces shall be thoroughly cleaned of all mill scales, oxides and other coating and prepared in the shops. The protective coating should be such as to prevent the deterioration of coating itself by him for internal and external surface protection which shall be checked and approved by BHEL / Owner. All surfaces which will not be easily accessible after the shop assembly, shall before hand be treated and protected for life of the equipment.	
11.2 The pre-treatment/ painting of the control panel shall be done by 7 tank process/ shot blasting/ sand blasting, by 2 coats of primer and 2 coats of paint of shade no. 692 as per IS: 6005. The total thickness of paint shall be a minimum of 180 micron and maximum of 250 micron.	
11.3 After testing of unit, its internals shall be thoroughly cleaned, dried and conserved before packing. Conservation shall be suitable for storing in saline atmosphere & for a period of 2 years before use. Unit shall be suitably packed for transportation. Supplier shall be responsible for all loss or damage during transportation, handling and storage due to improper packing.	
11.4 Painting treatment for LCP shall be as per IS: 6005. Two coats of lead oxide primer followed by powder painting. External shade for front and Rear shall be RAL9002 and for panel sides shall be RAL5012. Internal color shall be same as external color indicated above.	
12 DESIGN CO-ORDINATION MEETING	
Supplier shall attend the meeting on his own cost, whenever felt necessary, called by purchaser / owner to clarify the subject matter to them during engineering, erection, commissioning, and any stage prior to handing over.	
13 LIST OF CROSS-REFERRED STANDARDS	
13.1 IS: 10816-2	
13.2 IS: 325,	
13.3 IS: 4029,	
13.4 IS: 2147,	
13.5 IS: 2148,	
13.6 IS: 6005,	

Rev. no. 08	निर्माणकर्ता WORKED BY: Anil / Kavita	Anil Kumar Kavita	18.03.16
	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	18.03.16

हस्ताक्षर एवं तारीख SIGN & DATE				उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)		ST39013	
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सामग्री सूची संख्या को अपडेटिंग करना है		13.7 IS: 5, 13.8 IS: 4722, 13.9 IS: 2253, 13.10 IS: 2254, 13.11 IS: 3202, 13.12 IS: 4722-1992, 13.13 ISO: 4406, 13.14 IS: 12075, 13.15 IS: 12615:2011, 13.16 IS: 10816-2.					
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company							
स्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी एलेक्ट्रिकल्स लिमिटेड की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप में किसी भी तरह प्रकाश को कि कंपनी के हित में हानिकारक हो न किया जाए।							
हस्ताक्षर एवं तारीख SIGN & DATE		Rev. no.		निर्माणकर्ता WORKED BY:		Anil / Kavita	
		08		जाँचकर्ता CHECKED BY:		A. S. Rajput / Devesh	
सामग्री सूची संख्या INVENTORY NO.		12558		निर्माणकर्ता WORKED BY:		Anil kumar Kavita	
				जाँचकर्ता CHECKED BY:		Devesh 18.03.16	

SIGN & DATE SIGNATURE SIGNATURE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013
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SUPPLIES INVENTORY NO. सामग्री सूची संख्या को अधिकृत करना है	14 ANNEXURE-I (PROPERTIES OF TURBINE OIL)																																																																									
	<table border="1"> <thead> <tr> <th>S. No.</th> <th>Properties</th> <th>Value</th> <th>Test Method</th> </tr> </thead> <tbody> <tr> <td>1. a.</td> <td>Kinematic viscosity at 37.8°C</td> <td>47.5 c.s. to 49.5 c.s.</td> <td>IS : 1448-P25</td> </tr> <tr> <td>b.</td> <td>Kinematic viscosity at 50.0°C</td> <td>28 c.s.</td> <td>IS : 1448-P25</td> </tr> <tr> <td>2.</td> <td>Viscosity index</td> <td>Min 97</td> <td>IS : 1448-P56</td> </tr> <tr> <td>3. a.</td> <td>Inorganic acidity</td> <td>Nil</td> <td>IS : 1448-P2</td> </tr> <tr> <td>b.</td> <td>Organic acidity</td> <td>Max. 0.14 mg of KOH</td> <td>IS : 1448-P2</td> </tr> <tr> <td>c.</td> <td>Neutralisation No.</td> <td>Max. 0.2 mg of KOH per gm of oil</td> <td>IS : 1012</td> </tr> <tr> <td>4.</td> <td>Colour</td> <td>Max. 2</td> <td>IS : 1448-P12</td> </tr> <tr> <td>5.</td> <td>Specific gravity at 50 °C</td> <td>0.852</td> <td>IS : 1448-P32</td> </tr> <tr> <td>6.</td> <td>Flash point Cleveland Open cup</td> <td>Min. 200°C</td> <td></td> </tr> <tr> <td>7.</td> <td>Copper strip corrosion test At 100°C for 3 hours</td> <td>Not worse than No.1</td> <td>IS : 1448-P15</td> </tr> <tr> <td>8.</td> <td>Pour point</td> <td>-6 °C max.</td> <td>IS : 1448-P10</td> </tr> <tr> <td>9.</td> <td>Rust preventing characteristics</td> <td>negative test passed</td> <td>ASTM : D665</td> </tr> <tr> <td>10.</td> <td>Emulsion characteristics</td> <td>40-40-0(20 minutes)</td> <td>ASTMD : 1401-67</td> </tr> <tr> <td>11.</td> <td>Total acidity after 1000 hrs. oxidation</td> <td>Max. 2.0 mg of KOH per gm of the oil.</td> <td>ASTMD : 943-54/ IP 157/64</td> </tr> <tr> <td>12.</td> <td>Foaming characteristics Max.</td> <td></td> <td></td> </tr> <tr> <td></td> <td>(a) At 24°C</td> <td>Nil</td> <td rowspan="2"> Volume in ml of foam after 10 minutes. </td> </tr> <tr> <td></td> <td>(b) At 93.5°C</td> <td>Nil</td> </tr> </tbody> </table>				S. No.	Properties	Value	Test Method	1. a.	Kinematic viscosity at 37.8°C	47.5 c.s. to 49.5 c.s.	IS : 1448-P25	b.	Kinematic viscosity at 50.0°C	28 c.s.	IS : 1448-P25	2.	Viscosity index	Min 97	IS : 1448-P56	3. a.	Inorganic acidity	Nil	IS : 1448-P2	b.	Organic acidity	Max. 0.14 mg of KOH	IS : 1448-P2	c.	Neutralisation No.	Max. 0.2 mg of KOH per gm of oil	IS : 1012	4.	Colour	Max. 2	IS : 1448-P12	5.	Specific gravity at 50 °C	0.852	IS : 1448-P32	6.	Flash point Cleveland Open cup	Min. 200°C		7.	Copper strip corrosion test At 100°C for 3 hours	Not worse than No.1	IS : 1448-P15	8.	Pour point	-6 °C max.	IS : 1448-P10	9.	Rust preventing characteristics	negative test passed	ASTM : D665	10.	Emulsion characteristics	40-40-0(20 minutes)	ASTMD : 1401-67	11.	Total acidity after 1000 hrs. oxidation	Max. 2.0 mg of KOH per gm of the oil.	ASTMD : 943-54/ IP 157/64	12.	Foaming characteristics Max.				(a) At 24°C	Nil	Volume in ml of foam after 10 minutes.		(b) At 93.5°C
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5.	Specific gravity at 50 °C	0.852	IS : 1448-P32																																																																							
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7.	Copper strip corrosion test At 100°C for 3 hours	Not worse than No.1	IS : 1448-P15																																																																							
8.	Pour point	-6 °C max.	IS : 1448-P10																																																																							
9.	Rust preventing characteristics	negative test passed	ASTM : D665																																																																							
10.	Emulsion characteristics	40-40-0(20 minutes)	ASTMD : 1401-67																																																																							
11.	Total acidity after 1000 hrs. oxidation	Max. 2.0 mg of KOH per gm of the oil.	ASTMD : 943-54/ IP 157/64																																																																							
12.	Foaming characteristics Max.																																																																									
	(a) At 24°C	Nil	Volume in ml of foam after 10 minutes.																																																																							
	(b) At 93.5°C	Nil																																																																								
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	स्वामित्व अधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स लिमिटेड की संपत्ति है। इसका प्रलेख एवं उपयोग अन्य में किसी भी तरह प्रयोग, ओर बिना इजाजत के हिल में शामिल किया जाये।																																																																									
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**SUPERSEDES
INVENTORY NO.**

सामग्री मूखी संख्या को
अधिक्रमिण करता है

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स्वत्वाधिकार एवं गोपनीय

SIGN & DATE

सामग्री सूची संख्या
INVENTORY

Rev. no.
08

निर्माणकर्ता
WORKED BY:

Anil / Kavita

Anil Kumar
Komita


18.03.16


जाँचकर्ता
CHECKED BY:


A. S. Rajput /
Devesh

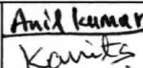
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%;">6.1</td> <td style="width:50%;">Heater details</td> <td style="width:40%;"></td> </tr> <tr> <td>6.1.1</td> <td>Quantity</td> <td>Nos.</td> </tr> <tr> <td>6.1.2</td> <td>Kilowatts</td> <td>kW</td> </tr> <tr> <td>6.1.3</td> <td>Rating of steps (kW)</td> <td></td> </tr> <tr> <td>6.1.4</td> <td>Voltage</td> <td>Volts (AC)</td> </tr> <tr> <td>6.1.5</td> <td>Frequency</td> <td>C/s</td> </tr> <tr> <td>6.1.6</td> <td>Phase</td> <td></td> </tr> <tr> <td>6.1.7</td> <td>Number of thermostat</td> <td>3 (2Nos. for oil temp. and one for water temp.)</td> </tr> <tr> <td>6.1.8</td> <td>Range</td> <td></td> </tr> <tr> <td>6.1.9</td> <td>Model</td> <td></td> </tr> <tr> <td>6.1.10</td> <td>Manufacturer</td> <td></td> </tr> <tr> <td>6.2</td> <td>Heater control thermostat setting</td> <td>Cut in at °C/ Cut out at °C</td> </tr> <tr> <td>6.2.1</td> <td>Rating of thermostat contacts</td> <td>5 amps 240V A.C 0.25 amps 240V D.C</td> </tr> <tr> <td>6.2.2</td> <td>No. of contacts</td> <td>2 No + 2 N C</td> </tr> <tr> <td>6.3</td> <td>Heater tubes</td> <td></td> </tr> <tr> <td>6.3.1</td> <td>Material</td> <td></td> </tr> <tr> <td>6.3.2</td> <td>Number</td> <td></td> </tr> <tr> <td>6.3.3</td> <td>Length</td> <td>mm</td> </tr> <tr> <td>6.3.4</td> <td>Outside diameter</td> <td>mm</td> </tr> <tr> <td>6.3.5</td> <td>Tube wall thickness</td> <td>mm</td> </tr> <tr> <td>6.3.6</td> <td>Surface area of heater tubes.</td> <td>mm²</td> </tr> <tr> <td>6.4</td> <td>Tube Sheets</td> <td></td> </tr> <tr> <td>6.4.1</td> <td>Material</td> <td></td> </tr> <tr> <td>6.4.2</td> <td>Number</td> <td></td> </tr> <tr> <td>6.4.3</td> <td>Thickness</td> <td>mm</td> </tr> <tr> <td>6.5</td> <td>Tube bundle type</td> <td>Removable/non-removable</td> </tr> <tr> <td>6.6</td> <td>Capacity of heater tank</td> <td>M3</td> </tr> </table>						6.1	Heater details		6.1.1	Quantity	Nos.	6.1.2	Kilowatts	kW	6.1.3	Rating of steps (kW)		6.1.4	Voltage	Volts (AC)	6.1.5	Frequency	C/s	6.1.6	Phase		6.1.7	Number of thermostat	3 (2Nos. for oil temp. and one for water temp.)	6.1.8	Range		6.1.9	Model		6.1.10	Manufacturer		6.2	Heater control thermostat setting	Cut in at °C/ Cut out at °C	6.2.1	Rating of thermostat contacts	5 amps 240V A.C 0.25 amps 240V D.C	6.2.2	No. of contacts	2 No + 2 N C	6.3	Heater tubes		6.3.1	Material		6.3.2	Number		6.3.3	Length	mm	6.3.4	Outside diameter	mm	6.3.5	Tube wall thickness	mm	6.3.6	Surface area of heater tubes.	mm ²	6.4	Tube Sheets		6.4.1	Material		6.4.2	Number		6.4.3	Thickness	mm	6.5	Tube bundle type	Removable/non-removable	6.6	Capacity of heater tank	M3
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			पृष्ठ 40 का 24 Page 24 of 40

सामग्री सूची संख्या को अचिह्नित करना है SUPERSEDES INVENTORY NO.	9.1	Capacity	
	9.2	Make & Model	
	9.3	Type	
	9.4	Number	
	9.5	Location	
	9.6	Material of filter element	
	9.7	Connection sizes	
	9.8	Design Pressure (body)	Kg/cm ²
	9.9	Pressure differential at choking	Kg/cm ²

10.0 INTERCONNECTING PIPINGS OF THE SYSTEM

10.1	Sizes of pipes	
10.2	Material of piping	

11.0 ANTI-FLOOD TANK

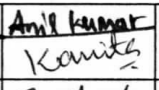
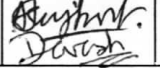
11.1	Capacity	
11.2	Number	
11.3	Location	
11.4	Connection sizes	


12.0 PNEUMATIC/SOLENOID OPERATED THREE-WAY VALVE

12.1	Make & Model	
12.2	Type	
12.3	Number	
12.4	Location	
12.5	Connection sizes	


13.0 INSTRUMENTS



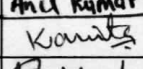
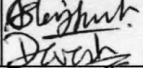
13.1	PRESSURE GAUGES: (For detailed specification refer Annexure-IV)	
13.1.1	Type	
13.1.2	Number	
13.1.3	Location	1) Inlet to pump (Compound gauge) 2) Outlet from feed pump 3) Water temperature of indirect heater Outlet from discharge Pump.(In case

सामग्री सूची संख्या INVENTORY NO.	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita		18.03.16
		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh		18.03.16

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SUPERSEDES INVENTORY NO	सामग्री सूची संख्या को अतिरिक्तित्व करता है	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;"></td> <td style="width: 40%;"></td> <td style="width: 45%;">polishing Filter, outlet from polishing Filter)</td> </tr> <tr> <td>13.1.4</td> <td>Range</td> <td>Kg/cm²</td> </tr> <tr> <td>13.1.5</td> <td>Accuracy</td> <td>± 1% or better</td> </tr> <tr> <td>13.1.6</td> <td>Manufacturer</td> <td></td> </tr> <tr> <td>13.2</td> <td colspan="2">TEMPERATURE INDICATORS: (For detailed specification refer Annexure-IV)</td> </tr> <tr> <td>13.2.1</td> <td>Type</td> <td></td> </tr> <tr> <td>13.2.2</td> <td>Number</td> <td></td> </tr> <tr> <td>13.2.3</td> <td>Location</td> <td>1) Inlet to electric heater 2) Outlet from electric heater 3) Inlet to centrifuge 4) Oil temperature at outlet of purifier</td> </tr> <tr> <td>13.2.4</td> <td>Range</td> <td>°C</td> </tr> <tr> <td>13.2.5</td> <td>Accuracy</td> <td>± 1% of span</td> </tr> <tr> <td>13.2.6</td> <td>Manufacturer</td> <td></td> </tr> <tr> <td>13.3</td> <td colspan="2">FLOW METER</td> </tr> <tr> <td>13.3.1</td> <td>Type</td> <td></td> </tr> <tr> <td>13.3.2</td> <td>Number</td> <td></td> </tr> <tr> <td>13.3.3</td> <td>Location</td> <td>Downstream of centrifuge feed pump.</td> </tr> <tr> <td>13.3.4</td> <td>Range</td> <td></td> </tr> <tr> <td>13.3.5</td> <td>Accuracy</td> <td></td> </tr> <tr> <td>13.3.6</td> <td>Connections, type & size.</td> <td></td> </tr> <tr> <td>13.3.7</td> <td>Model No.</td> <td></td> </tr> <tr> <td>13.3.8</td> <td>Manufacturer</td> <td></td> </tr> <tr> <td>13.4</td> <td colspan="2">PRESSURE SWITCH</td> </tr> <tr> <td>13.4.1</td> <td>Type</td> <td></td> </tr> <tr> <td>13.4.2</td> <td>Number</td> <td></td> </tr> <tr> <td>13.4.3</td> <td>location</td> <td>Outlet of centrifuge</td> </tr> <tr> <td>13.4.4</td> <td>Range</td> <td></td> </tr> <tr> <td>13.4.5</td> <td>Accuracy</td> <td></td> </tr> <tr> <td>13.4.6</td> <td>Model No.</td> <td></td> </tr> <tr> <td>13.4.7</td> <td>No. of contacts & contact rating</td> <td></td> </tr> <tr> <td>13.4.8</td> <td>Manufacturer</td> <td></td> </tr> <tr> <td>13.4.9</td> <td>End connection</td> <td>½" NPT(F)</td> </tr> <tr> <td>13.4.10</td> <td>Electrical connection</td> <td>Plug in socket</td> </tr> <tr> <td>13.4.11</td> <td>Repeatability</td> <td></td> </tr> <tr> <td>13.5</td> <td colspan="2">RESISTANT TEMPERATURE DETECTOR (RTD)</td> </tr> <tr> <td>13.5.1</td> <td>Type of RTD</td> <td></td> </tr> <tr> <td>13.5.2</td> <td>No. of element</td> <td>Duplex</td> </tr> <tr> <td>13.5.3</td> <td>Housing/ Head</td> <td>IP-55/Die cast Al. plug-in connectors are</td> </tr> </table>					polishing Filter, outlet from polishing Filter)	13.1.4	Range	Kg/cm ²	13.1.5	Accuracy	± 1% or better	13.1.6	Manufacturer		13.2	TEMPERATURE INDICATORS: (For detailed specification refer Annexure-IV)		13.2.1	Type		13.2.2	Number		13.2.3	Location	1) Inlet to electric heater 2) Outlet from electric heater 3) Inlet to centrifuge 4) Oil temperature at outlet of purifier	13.2.4	Range	°C	13.2.5	Accuracy	± 1% of span	13.2.6	Manufacturer		13.3	FLOW METER		13.3.1	Type		13.3.2	Number		13.3.3	Location	Downstream of centrifuge feed pump.	13.3.4	Range		13.3.5	Accuracy		13.3.6	Connections, type & size.		13.3.7	Model No.		13.3.8	Manufacturer		13.4	PRESSURE SWITCH		13.4.1	Type		13.4.2	Number		13.4.3	location	Outlet of centrifuge	13.4.4	Range		13.4.5	Accuracy		13.4.6	Model No.		13.4.7	No. of contacts & contact rating		13.4.8	Manufacturer		13.4.9	End connection	½" NPT(F)	13.4.10	Electrical connection	Plug in socket	13.4.11	Repeatability		13.5	RESISTANT TEMPERATURE DETECTOR (RTD)		13.5.1	Type of RTD		13.5.2	No. of element	Duplex	13.5.3	Housing/ Head	IP-55/Die cast Al. plug-in connectors are
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SUPERSEDES
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सामग्री सूची संख्या को
अधिकृतित करता है

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स्वत्वाधिकार एवं गोपनीय

समय प्रयोग में दी गई सूचना भारत हेवी एंगेजिक्लस लिमिटेड की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग जो कि कंपनी के हित में हानिकारक हो न किया जाय।

SIGN & DATE

सामग्री सूची संख्या

Rev. no. 08

निर्माणकर्ता
WORKED BY:

Anil / Kavita

Anil Kumar
Kanits


1803.16


जाँचकर्ता
CHECKED BY

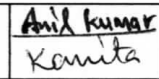
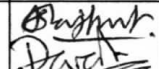
A. S. Rajput /
Devesh


Bright,
Dewak

18.03.16

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013
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SUPERSEDES INVENTORY NO. सामग्री सूची संख्या को अधिस्थिति करता है	16 ANNEXURE-III (SPECIFICATION OF MOTOR)																																												
	<p>1.0 A suitable motor conforming to the purification unit requirement shall be supplied. The motor shall also meet the following requirement broadly. The motor shall confirm to IS : 4722, IS : 325, IS : 2253, IS : 2254, IS : 4029, IS : 3202, IS12615:2011 & IS : 2148 or equipment BS : Specification. The motor shall meet all Indian statutory requirements.</p> <table border="1"> <tr> <td>1.1</td> <td>Application</td> <td>To drive feed pump (suction & discharge) and centrifuge</td> </tr> <tr> <td>1.2</td> <td>Type of Motor</td> <td>Squirrel cage, induction motor</td> </tr> <tr> <td>1.3</td> <td>KW Rating at 500 ambient temp</td> <td>It shall have at least 10-15% reserve capacity than required for drive the unit when it is discharging max. quantity at max. viscosity</td> </tr> <tr> <td>1.4</td> <td>KW actually required by driven equipment under specified operation/ start-up conditions.</td> <td>Unit capacity</td> </tr> <tr> <td>1.5</td> <td>Min. Voltage required under starting conditions to bring driven equipment up to rated speed.</td> <td>80% rated</td> </tr> <tr> <td>1.6</td> <td>Full load speed</td> <td>It shall be commensurate with pump & centrifuge speed as per design</td> </tr> <tr> <td>1.7</td> <td>Full load current</td> <td>As per design</td> </tr> <tr> <td>1.8</td> <td>Starting current</td> <td>Not to exceed 600% of the rated exclusive of IS tolerance</td> </tr> <tr> <td>1.9</td> <td>Starting Torque</td> <td>1.3 (Min) of rated torque</td> </tr> <tr> <td>1.10</td> <td>Break down torque</td> <td>2.05 times (min) of rated valve.</td> </tr> <tr> <td>1.11</td> <td>Efficiency at full load</td> <td>IE2 AS PER IS 12615:2011</td> </tr> <tr> <td>1.12</td> <td>Power factor at full load</td> <td>0.85 (Min)</td> </tr> </table> <p>1.13 Motor shall be designed to with stand the voltage and torque stresses developed due to difference between the motor residual voltage and incoming supply voltage equal to 150% of the rated motor voltage during fast changeover of buses.</p> <p>2.0 STARTING DATA</p> <table border="1"> <tr> <td>2.1</td> <td>Starting</td> <td>Suitable for DOL</td> </tr> <tr> <td>2.2</td> <td>Acceleration time with full load connected.</td> <td>To be furnished by supplier.</td> </tr> <tr> <td>2.3</td> <td>Permissible starting duty cycle, No. of Starts.</td> <td>3-Starts equally spread over an hour. 2-consecutive starts from hot condition without any injurious heating to the winding.</td> </tr> </table>	1.1	Application	To drive feed pump (suction & discharge) and centrifuge	1.2	Type of Motor	Squirrel cage, induction motor	1.3	KW Rating at 500 ambient temp	It shall have at least 10-15% reserve capacity than required for drive the unit when it is discharging max. quantity at max. viscosity	1.4	KW actually required by driven equipment under specified operation/ start-up conditions.	Unit capacity	1.5	Min. Voltage required under starting conditions to bring driven equipment up to rated speed.	80% rated	1.6	Full load speed	It shall be commensurate with pump & centrifuge speed as per design	1.7	Full load current	As per design	1.8	Starting current	Not to exceed 600% of the rated exclusive of IS tolerance	1.9	Starting Torque	1.3 (Min) of rated torque	1.10	Break down torque	2.05 times (min) of rated valve.	1.11	Efficiency at full load	IE2 AS PER IS 12615:2011	1.12	Power factor at full load	0.85 (Min)	2.1	Starting	Suitable for DOL	2.2	Acceleration time with full load connected.	To be furnished by supplier.	2.3	Permissible starting duty cycle, No. of Starts.
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1.5	Min. Voltage required under starting conditions to bring driven equipment up to rated speed.	80% rated																																											
1.6	Full load speed	It shall be commensurate with pump & centrifuge speed as per design																																											
1.7	Full load current	As per design																																											
1.8	Starting current	Not to exceed 600% of the rated exclusive of IS tolerance																																											
1.9	Starting Torque	1.3 (Min) of rated torque																																											
1.10	Break down torque	2.05 times (min) of rated valve.																																											
1.11	Efficiency at full load	IE2 AS PER IS 12615:2011																																											
1.12	Power factor at full load	0.85 (Min)																																											
2.1	Starting	Suitable for DOL																																											
2.2	Acceleration time with full load connected.	To be furnished by supplier.																																											
2.3	Permissible starting duty cycle, No. of Starts.	3-Starts equally spread over an hour. 2-consecutive starts from hot condition without any injurious heating to the winding.																																											
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company	स्वामित्व और गोपनीय इस दस्तावेज़ में दी गई सूचना भारत भारी लिमिटेड की सम्पत्ति है इसका प्रयोग के बिना या इसमें किसी भी तरह का परिवर्तन बिना भारत भारी लिमिटेड की अनुमति के नहीं किया जा सकता।																																												
दिनांक एवं हस्ताक्षर SIGN & DATE 	2/4/16																																												

सामग्री सूची संख्या INVENTORY NO. P-5538	Rev. no. 00	निर्माणकर्ता WORKED BY: Anil / Kavita		18.03.16
		जाँचकर्ता CHECKED BY: A. S. Rajput / Devesh		18.03.16

चिह्नक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013
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SUPERSEDES INVENTORY NO. सामग्री सूची संख्या को अधिकृतित करना है COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	2.4	Overload (% of full load) that can be Carried by motor without impairing Overall performance and period for Which this overload is applicable.	Motor shall be capable for running at full load with 80% of rated voltage for 5 minutes and 70% of rated voltage for 1 Sec. Locked rotor with stand time under hot condition at rated voltage shall be at Least 2.5 sec more than starting time
	2.5	Location	Turbine oil room indoor
	2.6	Class of Insulation	Class-F, fungus resistant as per IS:3202 with temp rise limited to that of class B.
	2.7	Shaft disposition mountings	As per Unit's supplier requirement.
	2.8	Method of connections driven equipment	As per Unit's supplier requirement.
	2.9	Direction of rotation and corresponding terminal designation	To suit pumps & centrifuge
	2.10	Enclosure and ventilation	Totally enclosed fan cooled and flame proof IP55.
	2.11	Bearing	As per supplier's design, min life 30,000 hrs
	2.12	Grounding Device	Suitable arrangement shall be provided for earthing the motor at two separate and distinct connection points. Design of earthing conductor shall be as per IS: 4722-1992.
	2.13	Terminal box	Flame proof terminal box to be provided with double compression Cable gland for AI cable Fault level : 45 KA for 0.01 Sec



3.0 SPECIAL REQUIREMENTS:

- 3.1 The motor shall be rewindable
- 3.2 The motor shall have on line greasing facility.
- 3.3 Motor shall be suitable for working in an environment of oil fumes without any hazard.
- 3.4 Separate terminal box for space heater (if applicable) to be provided.
- 3.5 Motor bearings (DE & NDE) shall be sealed type to avoid frequent Re-greasing.
- 3.6 The motor construction shall be suitable for easy disassembly and reassembly.
- 3.7 The terminal box shall be suitable for top and bottom entry of cable and shall be suitable for PVC insulated PVC sheathed armoured aluminium cables and shall be capable of being rotated by 180° in steps of 90°.
- 3.8 Motor vibrations shall be acceptable as per IS: 12075; motor efficiency as per IS 12615:2011 & noise level as per IS: 12065. Also mechanical vibrations shall be under limits as per IS: 10816-2.

4.0 DOCUMENTS TO BE SUPPLIED WITH DELIVERY WITH EACH UNIT. THESE SHALL BE SUPPLIED IN TWO COPIES & WORKABLE SOFT COPY.

सामग्री सूची संख्या INVENTORY NO. P-5598	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil Kumar	10.03.16
		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	Devesh	10.03.16

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013	
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सामग्री सूची संख्या INVENTORY NO.	सुपरसेड्स INVENTORY NO.	4.1 Characteristics: (at 80%, 100% and 110% of rated voltage) 4.1.1 Starting current v/s time 4.1.2 Torque v/s slip 4.1.3 Thermal with stand for HOT and Cold condition. 4.2 Type and frame size 4.3 Starting time 4.3.1 With 100% voltage at terminal 4.3.2 With 85% voltage at terminal 4.3.3 With 80% voltage at terminal 4.4 Safe install time at 110% rated voltage under hot condition. 4.5 Power rating requirement w.r.t. pump requirement. 4.6 Motor GD ² 4.7 Total wt. of motor. 4.8 Expected life of bearing (but not <30000 hrs.) 4.9 Type & size of cable for which gland is provided, in the terminal box. 4.10 Type & routine test certificate as per IS: 4722. 4.10.1 In addition to cl 4.10, the following tests shall also be carried out i) Degree of protection test as type test ii) 20% over speed test for 2 minutes as routine test. iii) Measurement of variation as routine test as per IS: 12075. 5.0 TESTS AT MANUFACTURE'S WORKS OF MOTOR: 5.1 Motor after complete assembly shall be subjected to both type and routine tests as per IS: 4722 5.2 Additional type test:- 5.2.1 Degree of protection test to conform to the specified degree of protection. 5.2.2 Measurement of noise level as per IS 12065, motor noise level shall be limited so as to achieve combined pump motor noise level as per clause no. 5(c). 5.3 Additional routine test: 5.3.1 20% over speed test for 2 minutes. 5.3.2 Measurement of vibrations per IS 12075. 6.0 CROSS REFERRED STANDARDS: IS:325 , IS:4722, IS:2253, IS:2254, IS:3202, IS:4029, IS:12065, IS:12075, IS:12615:2011		
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सामग्री सूची संख्या INVENTORY NO.	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	18.03.16	18.03.16

दिनांक एवं हस्ताक्षर SIGN & DATE सामग्री सूची संख्या INVENTORY NO. P-5538		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013																
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17 ANEXURE-IV (SPECIFICATION OF INSTRUMENTS)																			
1) PRESSURE GAUGE																			
The Pressure gauge should confirm to the following technical specification:-																			
a) The sensing element shall be SS-316 bourden tube. b) The dial size shall be approx. 150 mm diameter. c) The casing shall be epoxy coated die-cast aluminium with threaded bezel ring. d) The movement shall be stainless steel rotary gear with nylon bearings. e) The process connection shall be G1/2" f) The over range protection should be 150% of max. range g) The pointer shall be micrometer adjustable with zero facility on front. h) The accuracy shall be 1% of full scale. i) The gauge is to be provided with pulsation dampeners.																			
2) TEMPERATURE INDICATOR																			
<table border="1"> <tr> <td>Type</td> <td>Bimetallic rigid system type. No use of mercury or any other hazardous/toxic material</td> </tr> <tr> <td>Case</td> <td>Die cast aluminium alloy moisture proof case, heavily enamelled black</td> </tr> <tr> <td>Dial Size</td> <td>100 mm</td> </tr> <tr> <td>Range</td> <td>As per design</td> </tr> <tr> <td>Accuracy</td> <td>1% of total range</td> </tr> <tr> <td>Bulb Material</td> <td>½" bulb diameter made of SS. 316</td> </tr> <tr> <td>Thermo-well</td> <td>SS-AISI316 (with thread size G1/2")</td> </tr> <tr> <td>Ambient Temp</td> <td>60° C max.</td> </tr> </table>				Type	Bimetallic rigid system type. No use of mercury or any other hazardous/toxic material	Case	Die cast aluminium alloy moisture proof case, heavily enamelled black	Dial Size	100 mm	Range	As per design	Accuracy	1% of total range	Bulb Material	½" bulb diameter made of SS. 316	Thermo-well	SS-AISI316 (with thread size G1/2")	Ambient Temp	60° C max.
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Bulb Material	½" bulb diameter made of SS. 316																		
Thermo-well	SS-AISI316 (with thread size G1/2")																		
Ambient Temp	60° C max.																		
3) MAGNETIC LEVEL SWITCH																			
Process Connection: - Nb25 Material: All parts coming in contact with the liquid made of stainless steel SS316 Electrical characteristics Switch: Single pole double throw change over switch silver contact for handling the following currents AC 250V – 5.0A DC 250V – 0.25A Operating characteristics Differential – 6 MM I. e. 3 MM on either side of centre line working pr & Temp. : As per design Ambient Temp. : 60°C max.																			
दिनांक एवं हस्ताक्षर SIGN & DATE 																			
सामग्री सूची संख्या INVENTORY NO. P-5538																			
Rev. no. 08	निर्माणकर्ता WORKED BY: Anil / Kavita	जाँचकर्ता CHECKED BY: A. S. Rajput / Devesh	18.03.16 18.03.16																

सामग्री सूची संख्या INVENTORY NO 125338	दिनांक एवं हस्ताक्षर SIGN & DATE 20/04/14	स्वत्वधिकार एवं गोपनीयता The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	COPYRIGHT AND CONFIDENTIAL SUPERSEDES INVENTORY NO.	ANNEXURE-V (P&ID) SHEET 1 OF 1 <p>LEGEND:</p> <ul style="list-style-type: none"> DPS : DIFFERENTIAL PRESSURE GAUGE FG : FLOW GAUGE S : SOLENOID VALVE C : COMPOUND GAUGE PI-P4 : PRESSURE GAUGE TI-T3 : THERMOMETER TS1 : THERMOSTAT FOR WATER TS2 : THERMOSTAT FOR OIL TS3 : STOP VALVE NORMALLY OPEN L : STOP VALVE NORMALLY CLOSED F : LEVEL SWITCH PS : PRESSURE SWITCH LS : LEVEL GAUGE DPG : DIFFERENTIAL PRESSURE GAUGE <p>CONNECTIONS:-</p> <ol style="list-style-type: none"> 1. INLET FOR UNTREATED OIL - 40NB FLANGED CONN. 2. OUTLET FOR TREATED OIL - 40NB FLANGED CONN. 3. HEATER RECIRCULATION - 40NB FLANGED CONN. (APPLICABLE ONLY FOR CENTRAL OIL PURIFICATION SYSTEM) 4. WATER INLET TO HEATER - 20NB HOSE CONNECTION. 5. HEATER WATER DRAIN & OVERFLOW - 20NB HOSE CONN. 6. HEATER OIL DRAIN - 20NB HOSE CONN. <p>NOTES:-</p> <ol style="list-style-type: none"> 1. FOR UNIT OIL PURIFIER KEEP V5 CLOSED & OPEN VALVE V13. 2. FOR CENTRAL OIL PURIFIER KEEP V13 CLOSED & OPEN VALVE V5.
Rev. no. 08				निर्माणकर्ता WORKED BY: Anil / Kavita
जाँचकर्ता CHECKED BY: A. S. Rajput / Devesh				18.03.16 18.03.16

उत्पाद क्रय विनिर्देश (हीप : हरिद्वार)
PRODUCT PURCHASE SPECIFICATION
(HEEP: HARIDWAR)



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INVENTORY NO.

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SIGN & DATE

सामग्री सूची संख्या
INVENTORY

Rev. no. 08

निर्माणकर्ता
WORKED BY

Anil / Kavita

Anil Kumar
Kumar

18.03.16

जाँचकर्ता

A. S. Rajput /
Devesh

Bright.
Dark


18.03.16


Planch 18.03.16

19 ANNEXURE-VI (QUALITY PLAN)

[illegible]

		<p>LEGEND:</p> <p>! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.</p> <p>M MANUFACTURER / SUBCONTRACTOR B BHEL / NQMA INSPECTION AGENCY N CUSTOMER</p> <p>INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION</p> <p>ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CIP' OF CUSTOMER</p>	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR			APPROVED BY	

चिह्नक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013 पृष्ठ 40 का 36 Page 36 of 40		
सामग्री सूची संख्या INVENTORY NO	20 ANNEXURE- VII (CHECK LIST) A. CHECK LIST FOR MECHANICAL ITEMS				
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited It must not be used directly or indirectly in any way detrimental to the interest of the company	Sl. No.	Technical Requirements	Vendor's confirmation (Yes/No)	Remarks (if any)	
	1.	Is capacity of oil purifier as per BHEL specifications (i.e. 7500 LPH)?			
	2.	a) Is particle size of impurities in the clean oil as per BHEL specifications in single pass (i.e. class 15/12 or better as per ISO4406)? b) Is moisture content in the clean oil as per BHEL specifications in single pass (i.e. ≤ 500 ppm)?			
	3.	Is the test certificate for particle size of impurities & moisture content provided as per BHEL specification?			
	4.	Is mode of operation (i.e. purifier/clarifier) as per BHEL specifications & enquiry?			
	5.	Is noise level as per BHEL specifications?			
	6.	Is overflow sight fitting provided as per BHEL specifications?			
	7.	Is capacity of oil feed & discharge Pump (i.e. at least 10% higher than capacity of the purifier) as per BHEL specifications?			
	8.	a) Is copies of O&M manual (CD based & hard paper based) provided as per BHEL specifications? b) Are 2 copies (hard paper based) of O & M manuals kept inside the dispatch box as per BHEL specifications & enquiry?			
	9.	Is polishing filter (β3= 1000 or better) provided as per BHEL specifications?			
	10.	Is supervision during erection & commissioning at site by vendor offered as per BHEL specifications & enquiry?			
	11.	Is lube oil recirculation piping/ piping connection provided as per BHEL specifications & enquiry?			
	12.	Are sufficient spares for satisfactory commissioning and for 3 years satisfactory operation of the purifier provided as per BHEL specifications?			
	13.	Are detailed lists of recommended spares and commissioning spares along with price break up provided as per BHEL specifications & enquiry?			
	14.	Is separate offer for conducting test for particle size of impurities and			
चिह्नक एवं हस्ताक्षर SIGN & DATE 18/03/16	Rev. no.		निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil Kumar Kavita 18.03.16
सामग्री सूची संख्या INVENTORY NO P-5598			जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	Devesh 18.03.16


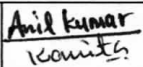
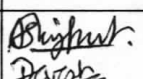
विनाक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013
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	15.	Is the painting scheme as per BHEL specifications/enquiry?		
	16.	Are all piping of oil purification system shall be stainless steel?		
	17.	Deviations taken (Please specify clearly, if any): a) b) c) d)		

Notes: Vendors shall fill relevant columns with Yes/ No/ Value offered.


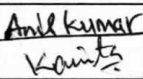
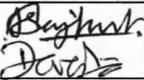
Date:
Place:

Signature &
Seal of manufacturer

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				जाँचकर्ता CHECKED BY: A. S. Rajput / Devesh		18.03.16

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SUPERSEDES INVENTORY NO. सामग्री सूची संख्या को अपरिचित करना है	B. CHECK LIST FOR C&I ITEMS <u>Check list for OPU (DCS Based)</u>				
	1. OPU is DCS Based with provision of operating from local controls panel as well control room; yes/ no 2. Plug and socket type connection for all pressure switch and level switch : yes/no 3. DCS/Local selector switch is provided on the Local control panel: yes/no 4. Relays shall be of 24 v dc and of vendor scope of supply: yes/no 5. List of drives to be operated through DCS is furnished along with list of instruments and alarms.: yes/no 6. All field instruments shall be wired to a JB which shall be in vendor scope.: yes/no 7. A pressure switch at outlet of centrifuge and a level switch in anti-flood tank shall be provided for detection of liquid seal breakage. 8. Arrangement for Liquid seal breakage alarm is provided : yes/no 9. Air requirement of pneumatic valves is mentioned: yes/no 10. Motor efficiency meeting as per special instruction/project requirement : yes ./no 11. Control panel is designed for 3 phase (415 v Ac) 3 wire power supply system: yes/no 12. Control panel is provided with anti-vibration pads to withstand vibrations: yes/no. 13. Motor data sheet shall be subject to customer/ BHEL approval: yes/no 14. Cable glands for 415 V AC incomer is provided : yes/no 15. On/Off control, indication and alarms is provided in local panel as well as HMI: yes/no 16. Painting treatment as per addendum or special instruction mentioned in indent: yes/no. 17. Construction of panel as per specification/addendum: yes/no. 18. Price break of spare item/spare of LS switchgear given along with offer: yes/no 19. 20% spare terminals have been provided at panel: yes/no.				
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	स्वत्वधिकार एवं गोपनीय इस प्रलेख में की गई सूचना भारत भारती भारतीभूतक निरिद्धि की संपत्ति है इसका प्रयोग एवं प्रसारण के बिना की जाह्न प्रयोग को कि कंपनी के हित में हानिकारक हो न किया जाए।				
	दिनांक एवं हस्ताक्षर SIGN & DATE				
सामग्री सूची संख्या INVENTORY NO. P-55 38	Rev. no. 08	निर्माणकर्ता WORKED BY:	Anil / Kavita	Anil Kumar Kavita	18.03.16
		जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh	A. S. Rajput Devesh	18.03.16

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SIGN & DATE		
P-5538		
Rev. no. ०१	निर्माणकर्ता WORKED BY:	Anil / Kavita
	जाँचकर्ता CHECKED BY:	A. S. Rajput / Devesh
		Anil Kumar Kavita
		Rajput Devesh
		18.03.16
		18.03.16

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद क्रय विनिर्देश (हीप : हरिद्वार) PRODUCT PURCHASE SPECIFICATION (HEEP: HARIDWAR)	ST39013 पृष्ठ 40 का 40 Page 40 of 40		
SUPERSEDES INVENTORY NO. सामग्री सूची संख्या को अधिस्थिति करता है	<div style="text-align: center;"> Check list for OPU (Relay Based) </div> <ol style="list-style-type: none"> Oil Purification Unit is relay based: yes/no On/Off control, indication and alarms is provided in local panel: yes/no Control panel is designed for 3 phase (415 v Ac) 3 wire incomer power supply system: yes/no Motor efficiency meeting as per special instruction/project requirement : yes /no Air requirement of pneumatic valves is mentioned: yes/no. A pressure switch at outlet of centrifuge and a level switch in anti-flood tank is provided for detection of liquid seal breakage: yes/no Cable glands for 415 V AC incomer is provided : yes/no Adequately sized copper ground bus is provided for each panel: yes/no Painting treatment as per addendum or special instruction mentioned in indent: yes/no Paint shade of control panel as per addendum/special requirement: yes/no Construction of panel as per specification/addendum: yes/no Control panel is provided with anti-vibration pads to withstand vibrations: yes/no. Plug and socket type connection for all instruments : yes/no Arrangement for Liquid seal breakage alarm is provided: yes/no Price break of spare item/spare of LS switchgear given along with offer: yes/no Motor data sheet shall be subject to customer/ BHEL approval: yes/no 20% spare terminals have been provided at panel: yes/no All instruments shall be of reputed make. <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div> Date: &Place: </div> <div> Signature Seal of manufacturer </div> </div>				
सामग्री सूची संख्या INVENTORY NO. 22-55598	Rev. no. 08		निर्माणकर्ता WORKED BY: जाँचकर्ता CHECKED BY:	Anil / Kavita A. S. Rajput / Devesh	<div>  18.03.16 </div> <div>  18.03.16 </div>

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स्वयंसेविका एवं गोपनीय

इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स लिमिटेड की सम्पत्ति है इसका प्रयोग एवं प्रसारण केवल ही इसी की परम इजाजत से ही किया जा सकता है अन्यथा इसे कानून के अन्तर्गत दण्डनीय माना जाएगा।

दिनांक एवं हस्ताक्षर
SIGN & DATE

22/03/16