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			Sheet 1 of 14	

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TECHNICAL PURCHASE SPECIFICATION **FOR** **SUMP PUMP**

PROJECT	BTG PACKAGE FOR 1 X 120 MW GAS BASED CAPTIVE POWER PLANT
CUSTOMER	TATA STEEL LIMITED,KALINGANAGAR, ODISHA
CONSULTANT	FICHTNER CONSULTING ENGINEERS (INDIA) PVT. LTD. INDIA,CHENNAI,BENGALURU

Revisions:	Prepared by :	Checked by :	Approved by :	Date :
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DOCUMENTS TO BE SUBMITTED WITH THE BID:

The bidder must submit the following documents along with their bid to enable BHEL to evaluate their offer.

- i. Pump & Motor datasheet
- ii. Pump & Motor performance Curve
- iii. Tentative GA Drawings for BHEL Reference only
- iv. Un-priced copy of price in attached BHEL price bid formats **(Annexure-1)** indicating quoted/ not quoted against each row & column.

In case the above-mentioned documents are not submitted with the offer, the offer of the bidder may be liable for technical rejection.



1. INTENT OF SPECIFICATION

This specification specifies the requirement of Design, Engineering, Manufacturing, Assembling, Inspection, Testing at manufacturer's works and Delivery properly packed and painted for transport of **Sump Pump including drives** with all accessories as specified in the scope of work and as required for the safe and trouble-free operation of equipment to be installed at site.

It is not the intent to completely specify all details of design and construction herein. Nevertheless, the equipment and installation shall conform to high standard of engineering design and workmanship in all respects and shall be capable of performing satisfactory and continuous operation.

2. SPECIAL NOTES TO BIDDERS

- 2.1 This specification shall be read in conjunction with its enclosures. In case of any discrepancy arising between this specification & its enclosures, the most stringent of all shall be followed and shall over-ride others. Further, if a requirement in this specification or its enclosures, calls for decision of owner/BHEL, it shall be bidder's sole responsibility to clearly bring out the same distinctively in his technical tender offer, so as to enable owner/BHEL to furnish their decision. If such a requirement is not duly addressed by bidder during tender stage and same comes out during order execution stage, it shall be binding on the bidder to comply with the decision furnished by owner/BHEL then, without any cost, delivery, or any other commercial implications.
- 2.2 Any additional equipment, material, etc., which are not specifically mentioned here, but are required to make the supplied equipment complete in all respect, in accordance with the intent of this technical specification, contractual agreement, statutory requirements, relevant/applicable codes/standards, good engineering practices, and for safe and trouble-free operation, shall be deemed to be covered under the scope of this specification.
- 2.3 The Bidder shall accept full responsibility for the completeness and for the faultless working of all the equipment's. These shall be executed on the basis of proven design principle and in accordance with the latest state of the art in such a manner that the purpose to be served by the Pump unit is fulfilled in every respect and a maximum of operational dependability and efficiency are assured. Standardization of equipment, materials etc. shall be employed in the design. Care shall be taken to ensure safe operation as well as simplicity of assembling and dismantling of all parts of the plant.
- 2.4 Bidder shall quote strictly as per the scope of supply and requirements of this specification.
- 2.5 Bidder offer shall be strictly as per these specification requirements. Unsolicited or Alternate offers from the bidders will not be entertained.
- 2.6 In case bidder feels that it is necessary to exclude some components of scope of supply or some of the features of specification requirements due to any technical



constraints, bidder shall bring the same to the notice of purchaser during pre-bid stage and take their prior approval before submission of their bid.

- 2.7** Incase Bidder is unable to offer due to any specific requirement of specification; Bidder shall bring out the same in their regret letter. Otherwise, it will be considered that non-participation by the bidder is attributable to reasons other than any specification requirements.

3. PROJECT INFORMATION

PROJECT	BTG PACKAGE FOR 1 X 120 MW GAS BASED CAPTIVE POWER PLANT
CUSTOMER	TATA STEEL LIMITED,KALINGANAGAR, ODISHA
CONSULTANT	FICHTNER CONSULTING ENGINEERS (INDIA) PVT. LTD. INDIA,CHENNAI,BENGALURU

Note: Any data required for designing the equipment, bidder may ask prior to the submission of bid.

4. TECHNICAL REQUIREMENTS AND SCOPE OF SUPPLY

4.1.1. Technical requirement for Sump pump for Oily Waste Water Collection Pit

Sl. No.	Pump	Sump Pump
1	Number of Pumps & Motors	Total: 4 Nos. [2 Nos. for Oily waste Water Pit for SG-1] [2 Nos. for Oily waste Water Pit for SG-1]
2	Drive(Pump Supplier Scope)	Motor
3	Pump Type	Vertical open well, Single stage, Submersible.
4	Pump Standard	Manufacturer Standard
5	Application	Transfer oily wastewater from pit to customer terminal point. The pump shall be capable of handling water with small solids of size up to 10 mm.
6	Design Pump Capacity	2.5 m ³ /hr
7	Design Pump Differential Head	30 mlc
8	Power Supply	3 phase, 415V, (+/- 10%), 50Hz (+/- 5%)
9	Material of construction	Suitable for Submersible Pump for oily waste water

10	Duty	Continuous
11	Area classification	Safe
12	Maximum temperature of operating fluid	50 degree C Bidder to select design temperature of pump accordingly
13	Pump operation	Pump shall be start if the pit level is high & stop if the level is low. For this, BHEL shall provide Level switch. Provision for execution of start/stop of pump from Level Switch (Level Switch provided by BHEL) to be considered in control Panel (Control panel to be supplied by Bidder) and necessary items required for execution of same is in bidder's scope. [R01] Since BHEL shall provide SFU feeder, bidder to provide DOL starter for the motor. Further, the control panel shall able to execute pump start/stop based on the feedback received from level switch. In addition to the above, the control panel shall have features for executing following features. i) Moisture Sensor ii) Motor Winding Temp. iii) Oil Temp. sensor iv) Dry Running Protection.

All Electrical items, as part of scope of supply of this specification, like Motors, Starter Panel, Level switch, 3 pin plug, Cabling (Power & Control), Junction Box, Cable glands & lugs etc. shall be of weather Proof type suitable for this [submersible] application.

4.1.2. Technical requirement for Sump pump for Oily Waste Water Collection Pit for STG Area

Sl. No.	Pump	Sump Pump
1	Number of Pumps & Motors	Total: 2 Nos. [2 Nos. for Oily waste Water Pit for STG Area]
2	Drive(Pump Supplier Scope)	Motor
3	Pump Type	Vertical open well, Single stage, Submersible.
4	Pump Standard	Manufacturer Standard

5	Application	Transfer oily wastewater from pit to customer terminal point. The pump shall be capable of handling water with small solids of size up to 10 mm.
6	Design Pump Capacity	2.5 m ³ /hr
7	Design Pump Differential Head	40 mlc
8	Power Supply	3 phase, 415V, (+/- 10%), 50Hz (+/- 5%)
9	Material of construction	Suitable for Submersible Pump for oily waste water
10	Duty	Continuous
11	Area classification	Safe
12	Maximum temperature of operating fluid	50 degree C Bidder to select design temperature of pump accordingly
13	Pump operation	Pump shall be start if the pit level is high & stop if the level is low. For this, BHEL shall provide Level switch. Provision for execution of start/stop of pump from Level Switch (Level Switch provided by BHEL) to be considered in control Panel (Control panel to be supplied by Bidder) and necessary items required for execution of same is in bidder's scope. [R01] Since BHEL shall provide SFU feeder, bidder to provide DOL starter for the motor. Further, the control panel shall able to execute pump start/stop based on the feedback received from level switch. In addition to the above, the control panel shall have features for executing following features. i) Moisture Sensor ii) Motor Winding Temp. iii) Oil Temp. sensor iv) Dry Running Protection.

All Electrical items, as part of scope of supply of this specification, like Motors, Starter Panel, Level switch, 3 pin plug, Cabling (Power & Control), Junction Box, Cable glands & lugs etc. shall be of weather Proof type suitable for this [submersible] application.

4.2. SCOPE OF SUPPLY

4.2.1. Scope of Supply for Sump pump for SG-1 & 2 and

Total No. of Pump & Drive Assembly: Six Nos. [2 Nos. for SG-1 Area+ 2 Nos. for SG-2 Area+ 2 Nos. for STG Area]

The scope of supply for each pump & motor drive assembly is as given below:

- i. Portable submersible type design pump including drive along with companion flanges for pump, 90 degree elbow, and expander / reducer to meet the BHEL pipe size- 1" (For details pl. refer Annexure -3) required valves, instruments, power cable, control & Signal cable, level Switch, local control panel and all other necessary accessories as per requirement.
- ii. Pump with totally enclosed squirrel cage induction motor suitable for continuous duty with IP 68 protection and class "F" insulation. Pump shall be provided with non - clogging impellers and mechanical seals. The bearings shall be maintenance free antifriction type with permanent grease fill.
- iii. Suitable level switch of IP-68 protection shall be provided to switch off the motor in case of low water level in the sump.
- iv. 10 m power & control cable from pump & motor assembly to local control panel
- v. Suitable DOL starter module having L&T/Siemens make components, with start/stop push buttons, Over load relay, contactor, indicating lamps, glands, lugs with IP 55 protection shall be provided. Suitable rating Local Starter panel shall be provided with suitable power cable of 60 m length & 3 pin flame proof plug to connect to 3-phase power socket, provided by BHEL.

Other details are as mentioned below:

- a. Indicating lamps shall be clustered LED type.
 - b. If applicable, mounting hardware as required shall be supplied along with the panel.
 - c. Internal wiring shall be carried out with 1.1kV, PVC insulated flexible multi stranded 1.5 sq.mm Cu wires.
 - d. Only 415 V SFU feeder shall be provided by BHEL upto control panel. Vendor shall derive auxiliary/control power supplies as required.
 - e. Power supply for control circuit shall be tapped through HRC fuses.
 - f. Ratings of power circuit components shall follow Type-2 coordination.
 - g. Based on manufacturer requirement the cable of suitable size from starter panel to motor is to be considered.
- vi. Following Protection as a minimum for Submersible Pump to be provided :
- i) Moisture Sensor ii) Motor Winding Temp. iii) Oil Temp sensor iv) Dry Running Protection.

All the signals to be terminated in PMU (Control Junction Box) having local indication as applicable. If any provision is not required bidder to bring out proper reasoning of non- consideration.

Since all these pumps are submersible pumps, a Junction Box shall be supplied by Pump supplier at which all the Power and control cables from Motor will be



terminated. Hence each cable (from Motor to JB) of 10 meters length shall be considered in Supplier's scope. Separate cable for Power and Signal cable to be provided. Signal cable carrying both power and control signal is not acceptable.

1 No. 415V power supply SFU feeder will be provided for motor. Other Auxiliary/control power supplies as required shall be derived by vendor from 415 V.

The Electrical Power and C&I control cables from motor shall be brought upto a Junction box. Necessary cables and termination accessories for all the vendor-supplied equipment shall be in Suppliers scope.

- vii. M.S. Galvanized lifting chain of minimum 6 mtrs to be provided.
- viii. All other items necessary for safe and smooth running of pump & Accessories required to make the supplied equipment complete in all respect.
- ix. Since the control of pump is from Local starter panel [to be provided by the bidder] only, Hence BHEL will provide only an SFU feeder for the same.
- x. Glands and lugs for power cable, control cable, Space heater cable and earthing cable (if any) suitable at motor end has to be supplied along with the main equipment. Glands shall be Flame proof/weather proof (as per motor category) double compression type Nickel plated Brass (ET) shall be provided with back nut and PVC shroud. Lugs shall be tinned copper heavy duty lug. Cable dimensions shall be furnished during detail engineering, accordingly glands, lugs shall be supplied.
- xi. Material of enclosure shall be 2mm CRCA sheet steel and Gland plate shall be 3mm CRCA sheet steel.
- xii. Commissioning spares*

Six sets of commissioning spares shall be quoted as per manufacturer's recommendation.

1 set stands for requirement for one no. of pump and drive assembly

*Bidder to furnish the list along with the offer regarding requirement of commissioning spares. Any commissioning spare consumed over and above the recommended commissioning spares, during commissioning shall be supplied free of cost by the equipment vendor. Any leftover (unused) spares after commissioning, out of those included by vendor, shall be handed over to the owner.

- xiii. Special Tools & Tackles

Special tools & tackles required during E&C Shall be supplied by Bidder. The bidder shall furnish a complete set [6 sets for all pumps] of all special tools & tackles and include in their scope for operation and maintenance [disassemble, assemble, or maintaining the unit] of the Pump assembly supplied, as a part of scope of supply.



Bidder shall furnish a list of such tools along with offer for the system.
 Prices for the special tools and tackles shall be part of main scope of supply.

xiv. Recommended spares

Bidder to furnish optional prices for 2 year recommended spares as per equipment manufacturer's recommendations. [The Bidder shall quote separately with optional price for the recommended list of spare parts for operation, with recommended quantities for the equipment covered under this specification. Bidder shall furnish such a list along with offer. The list of spares shall be as per Bidder's experience.]

5. QUALITY PLAN & INSPECTION AGENCY:

Quality Plan: Pls refer annexure-2 for typical quality plan.

Bidder to furnish Quality Plan to BHEL/Tata Steel/Consultant for approval after award of contract. Quality plan will be reviewed during detailed Engineering stage with respect to Inspection, standard Engineering practices & Specification Requirements and various tests and stages of inspection and appropriate agencies for Inspection will be Intimated. Bidder to abide by the same.

Inspection agency:

BHEL/Third Party appointed by BHEL/Tata Steel/Consultant. The various review/witness/observation stages by Individual agencies (or) Group of Agencies as above will be in line with approved quality plan.

6. PACKING AND FORWARDING

Pump & Motor shall be Properly Packed for the Delivery as per standard industrial practices.

7. DOCUMENTATION

- i. Docume ntation shall be submitted by bidder during detailed engineering stage, as per the Master Document List to be mutually finalized during detailed engineering stage.
- ii. No. of Copies to be furnished :

All the documents shall be submitted as given below:

S.No.	DESCRIPTION	No. of copies to be Provided	WHEN TO SUBMIT



1	Initial drawings/documents under approval and information category.	4	Within 2 weeks of placement of order
2	Revised drawings/documents incorporating BHEL's comments.	4	Within 1 week of receipt of commented Drawings from BHEL
3	Final Drawings/documents	10	Within 2 months of placement of order.
4	Erection Documentation	5	2 Months before dispatch of equipment, The list of documents identified under master document list for erection to be furnished in 5 nos. of folders.
5	Draft O & M Manuals with out test certificates (if felt necessary)	2	2 months before the delivery date of equipment
6	Revised O & M Manuals with Test Certificates to be submitted to BHEL (Hyderabad)	17	Within one month after dispatch of equipment
7	Final O&M Manuals in a CD	3	Within one month after dispatch of equipment

Following drawings to be submitted for BHEL approval:

- GA drawing, Datasheet, Cross sectional drawing, Performance Curves for Pump & Motor
- GA drawing, Wiring diagram of DOL starter module

Notes

The O&M manuals shall contain the following as minimum:

- i. The identification details of the equipment like BHEL P.O. No., Vendor's Job Identification No., full contact address with telephone, fax, & e-mail details.
- ii. Brief description of the system.
- iii. All approved documents [Drawings, documents & test procedures as per MDL]
- iv. Bill of material, BBU, LO schedule, sub vendor list, Mandatory & commissioning spares list etc.
- v. Operation, Instruction & maintenance manuals of all equipment's / items of the complete package
- vi. System unloading, storage erection, start up, commissioning, shut down requirements.
- vii. Operational & environmental safety instructions.
- viii. Test reports and certificates.
- ix. Catalogues of the equipment & instrumentation.

8. Sub Vendor List: Following sub vendors to be considered. Items for which Sub vendors are not mentioned, Bidder to take prior BHEL approval of sub vendors.

- a) POWER CABLE: POLYCAB/APAR INDUSTRIES/SPECIAL CABLES/ UNIVERSAL/ RPG/KEI,BHIWADI/HAVELLS/SKYTONE/LASER CABLES/GEMS CAB/SBEE CABLES/V-GUARD INDUSTRIES/CCI /CORDS/GENERAL CABLE INDIA/ TBEA CHINA/NEW BAOFENG CHINA/FAR EAST CHINA/GUPTA POWER LTD
- b) CONTROL CABLE: POLYCAB/APAR INDUSTRIES/SPECIAL CABLES/ UNIVERSAL/ RPG/KEI,BHIWADI/HAVELLS/SKYTONE/LASER CABLES/GEMS CAB/SBEE CABLES/V-GUARD INDUSTRIES/CCI /CORDS/GENERAL CABLE INDIA/ TBEA CHINA/NEW BAOFENG CHINA/FAR EAST CHINA/GUPTA POWER LTD
- c) SIGNAL CABLE: Cords Cable/Udey Pyrocables/ Special Cables/ Thermo cables
- d) Cable Glands: BALIGA/DOWELLS/CCI/ELECTROMEG/Metal Craft Industries Rajkot
- e) JUNCTION BOX: PANAM CONTROLS/EX-PROTECTA/FLAMEPROOF EQUIPMENTS PVT.LTD./PYROTECH ELECTRONICS PVT. LTD./SAFEX FLAMEPROOF CONTROLS (P) LTD

103	PUSH BUTTONS	SIEMENS / L&T / BCH / SCHNEIDER-TELEMECHANIQUE
104	LT FUSES (HRC)	SIEMENS / L&T / GE India / ABB / SCHREIDER-TELEMECHANIQUE / BUSSMAN
105	TIMER	SIEMENS / BCH / L&T / SCHREIDER-TELEMECHANIQUE / ALSTOM
106	CONTROL SWITCHES	SIEMENS / KAYCEE / L&T / ALSTOM / SCHREIDER-TELEMECHANIQUE / SC&S / STANDARD / HHE
114	SWITCH FUSE/D FUSE SWITCH	SIEMENS / L&T / GE INDIA / SCHNEIDER-TELE-MECHANIQUE
108	LOCAL CONTROL BOX / CONTROL PANELS / CONTROL DESK	SIEMENS / ABB / TECHNOCOMMERCE / TECHNOCRATS / SEN & SINGH / SWITCHING CKTS / POWER & PROTECTION / L&T / VAAY PROTECH / ALSTOM



9. VARIANT TABLE:

Sl. No.	Item	Material Code
01	Oily Waste Water Pit Pump for SG-1 Area including commissioning spares and Special Tools tackles	PY9751565014
02	Oily Waste Water Pit Pump for SG-2 Area including commissioning spares and Special Tools tackles	PY9751565022
03	Oily Waste Water Pit Pump for STG Area including commissioning spares and Special Tools tackles	PY9751565030

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ANNEXURE – 01
(PRICE BID FORMAT)

		BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD-502032				
PROJECT ENGINEERING & SYSTEMS DIVISION						
PRICE FORMAT (R00) FOR SUMP PUMP WITH ELECTRIC MOTOR DRIVE FOR OILY WASTE WATER COLLECTION PIT FOR SG-1 & 2 AREA CUSTOMER: TATA STEEL LIMITED,KALINGANAGAR, ODISHA PROJECT: BTG PACKAGE FOR 1 X 120 MW GAS BASED CAPTIVE POWER PLANT CONSULTANT: FICHTNER CONSULTING ENGINEERS (INDIA) PVT. LTD. INDIA, CHENNAI, BENGALURU						
SL NO	ITEM DESCRIPTION	QTY	UNIT	Weightage w.r.t Overall Price (In %)	HSN/SAC Code	GST (%)
Bidder's Name : <Bidder to indicate> Bidder's Offer No. & Dt. : <Bidder to indicate> Bidder's Ref No. & Dt. : <Bidder to indicate> BHEL Enq. No. & date : <Bidder to indicate>						
I MAIN OFFER [Note:Prices for individual items to be quoted as indicated in the price bid format.]						
A	MATERIAL SUPPLY:PUMP & MOTOR FOR OILY WASTE WATER COLLECTION PIT FOR SG-1 AREA WITH REQUIRED ACCESSORIES AS PER SPECIFICATION, COMMISSIONING SPARE AND SPECIAL TOOL AND TACKLES[Material code: PY9751565014]			0.5		
A.1	Pump & Motor for Oily Waste Water Collection Pit for SG-1 Area with required accessories inline with requirements mentioned in specification including commissioning spare and special tool and tackles. Note: i) Pump & Motor for Oily Waste Water Collection Pit for SG-1 Area (weather proof) with required accessories. ii) One set of commissioning spares per pump & Motor shall be quoted as per manufacturer's recommendation. 1 set stands for requirement for one no. of pump/drive assembly Bidder to furnish the list along with the offer. (Ref. Note-7) iii) Special tools & tackles for pump and its drive as per manufacturer's recommendations. 1 set stands for requirement for each pump, drive and other accessories. Bidder to furnish the list along with offer.	2	Sets			
B	MATERIAL SUPPLY:PUMP & MOTOR FOR OILY WASTE WATER COLLECTION PIT FOR SG-2 AREA WITH REQUIRED ACCESSORIES AS PER SPECIFICATION, COMMISSIONING SPARE AND SPECIAL TOOL AND TACKLES[Material code: PY9751565022]			0.5		
B.1	Pump & Motor for Oily Waste Water Collection Pit for SG-2 Area with required accessories inline with requirements mentioned in specification including commissioning spare and special tool and tackles. Note: i) Pump & Motor for Oily Waste Water Collection Pit for SG-2 Area (weather proof) with required accessories. ii) One set of commissioning spares per pump & Motor shall be quoted as per manufacturer's recommendation. 1 set stands for requirement for one no. of pump/drive assembly Bidder to furnish the list along with the offer. (Ref. Note-7) iii) Special tools & tackles for pump and its drive as per manufacturer's recommendations. 1 set stands for requirement for each pump, drive and other accessories. Bidder to furnish the list along with offer.	2	Sets			
Note: i) The word "set" means the quantity required for full replacement of that part in one machine. ii) The word "TYPE" means the Make, Model no., Type, Range, Size/ Length, Rating, Material as applicable iii) Above Quantity/Items are required for each type and rating of Pump/ diesel engine being supplied under the contract						
TOTAL				1		
3 TAXES AND DUTIES: (Packing and Forwarding, Freight, Insurance, Taxes & Duties as applicable to be quoted below separately for both Supply and E&C)						
(A) For Supply:						
(i) Packing & Forwarding :	In bidder scope	Included in basic price				
(ii) Freight:	In bidder scope	Included in basic price				
(iii) Insurance:	By BHEL					
(iv) Taxes and Duties	Extra at actuals					
(v) Any other:	shall be included in basic price of pumps					
(B) For E&C:						
(i) Service Tax:	Extra at actuals					
(ii) Any other:	Included in basic price					
Notes: 1) Bidders should quote the Total Bid Value in both in figures & words in the specified place. 2) Bidders should mention the applicable HSN/SAC code along with GST% against respective line items. 3) Bidders shall not fill/edit/modify anything else in the Price Bid Format.						

Annexure-1A

		BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD-502032				
PROJECT ENGINEERING & SYSTEMS DIVISION						
PRICE FORMAT (R00) FOR SUMP PUMP WITH ELECTRIC MOTOR DRIVE FOR OILY WASTE WATER COLLECTION PIT FOR SG-1 & 2 AREA CUSTOMER: TATA STEEL LIMITED, KALINGANAGAR, ODISHA PROJECT: BTG PACKAGE FOR 1 X 120 MW GAS BASED CAPTIVE POWER PLANT CONSULTANT: FICHTNER CONSULTING ENGINEERS (INDIA) PVT. LTD. INDIA, CHENNAI, BENGALURU						
SL NO	ITEM DESCRIPTION	QTY	UNIT	Weightage w.r.t Overall Price (In %)	HSN/SAC Code	GST (%)
	Bidder's Name : <Bidder to indicate> Bidder's Offer No. & Dt. : <Bidder to indicate> Bidder's Ref No. & Dt. : <Bidder to indicate> BHEL Enq. No. & date : <Bidder to indicate>					
4) The rates of line items mentioned in the Price Format shall be derived by BHEL by multiplying the Total Bid Value (G) quoted by the Bidder with the Weightage Factor assigned against respective line items. The rate of each item shall be rounded off to the next 1 (one) paisa.						
5) The Total Bid Value quoted by the Bidder shall represent the total landed cost for this enquiry and shall include Packing & Forwarding Charges, Freight Charges, and all applicable taxes and duties, other than GST. GST shall be paid extra by BHEL at applicable rates and transit insurance is in BHEL Scope						
6) Evaluation shall be done on the basis of total bid value i.e. the total landed cost to BHEL for this enquiry. Loading (if applicable) shall be added to the Total Bid Value for evaluation purpose.						
7) The bidders will also provide un-priced price format strictly in the BHEL price format given above, in the techno commercial part of their offers. Bid will be rejected if any other price format is used. Both priced and un-priced price formats to be provided by the bidders shall be signed and stamped copies.						
8) Bidder to quote strictly as per BHEL's NIT requirements.						
9) Bidder to note that this is a LUMP SUM Turn-Key Order. However (a) Changes to the tender specification during execution of the project for successful operation of the system need to be carried out by bidder and commercial implications if any will be settled suitably. (b) Unit rates quoted by bidder shall be applicable for any changes in BOQ during detailed engineering stage.						
10) Main offer consists of those items which will be part of main order after successful bidder is identified. Optional items consists of those items which need to be quoted by bidder but may or may not be ordered by BHEL. Bidders are instructed to provide the pricing details listed under Main offer and Optional items as per the prescribed format.						
11) Prices quoted by bidders for items under main offer : Sl. No. I [A to B] will be considered for evaluation of lowest bidder. However, BHEL reserves the right. (a) To include any of the optional items in scope of supply (as per customer contract requirements) and accordingly consider the same in evaluation. Any such scope increase and change in evaluation will be intimated to vendor during technical evaluation (before price bid opening). (b) To place PO for any of the Optional items with in the contract period. Hence bidders need to mandatorily quote reasonable prices for all optional items considering such requirement and keep the validity of the prices till the end of contract period.						
12.a) For all items including Optional items, prices to be furnished in this prescribed price bid format only for each individual item. The price to be quoted against sl no A, B, C shall be Weightage w.r.t Overall Price as mentioned above. No combined prices, common prices or any other format will be accepted and such bids may be liable for rejection. 12 b) Bidder must not change the indicated item description, quantity & units in the price bid format. Bidder should only fill the unit rates & total price. 12 c) Bidder to quote for all the items as per price bid format. Incomplete/partial offer may be liable for rejection.						
13) Bidder to quote the base rates only. All other commercial charges for packing, freight, transportation, insurance, taxes & duties etc., shall be indicated separately.						
14 a.) Commissioning spares are those spares which are required at the time of commissioning and shall be recommended (as per bidders experience) and quoted by bidder. However commissioning spares indicated in the price bid format shall be quoted as minimum. 14.b) Commissioning spare consumed over and above the recommended commissioning spares, during commissioning shall be supplied free of cost by the equipment vendor.						
15) With respect to Mandatory Spares: A) If any of above items indicated by the specified name are not applicable, bidder to offer alternative item serving the same function as per equipment's design and indicate below the item being replaced. B) If bidder is not able to meet the above note, then bidder may mention "Not Applicable". However, if found applicable during detailed engg. stage or alternative item as per equipment design can serve the same function, bidder to supply the specified quantity with out any delivery and commercial implications to BHEL.						
16) Reference document: BHEL Tender Specification (PY51565R01) & all its annexures.						
17) Unpriced price bid format indicating as quoted against each applicable item shall be submitted duly signed & stamped along with technical offer by bidder as a token of concurrence that prices are submitted in this format only. The offer shall be liable for rejection in case if un-priced price bid format is not submitted or any modification is carried out in price bid format.						
18) In case the systems are being supplied from outside India , reputed Third Party Inspection like Llyods or equivalent has to be considered and the charges should be included in the Main offer. For those bidders who are supplying from India, such third party inspection charges need not be considered and same will be arranged by BHEL/BHEL nominated inspection agency.						
19) i) With respect to Supervision charges, prices quoted by bidder shall be considered for L1 bidder evaluation. ii) Bidder to provide total price against sl. no C-1, that include per diem supervision charge including insurance charge of 1 service person (50 % of sl. No. C-1 price) + To and fro Travel expenses (30% sl. No. C-1 price) + 1 day boarding and lodging and local convenience etc charge (20 % sl. No. C-1 price). iii) Referring to Sl no C-1 - Supervision charges for Pump /Motor/Engine, For the purpose of Quotation, total no of 1 man days for Pump will be covered in 1 visits have been considered and payment against Sl.No C-1 above shall be made as per the actual number of visits and man days required for the supervision of the complete E&C activities as per these diem rates. Purchase Order for supply of main items, (A to C) shall be placed by BHEL- PE&SD Hyderabad. For Supervision of E&C, LOI & PO shall be placed by PE&SD.						

		BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD-502032				
PROJECT ENGINEERING & SYSTEMS DIVISION						
PRICE FORMAT (R00) FOR SUMP PUMP WITH ELECTRIC MOTOR DRIVE FOR OILY WASTE WATER COLLECTION PIT FOR STG AREA CUSTOMER: TATA STEEL LIMITED,KALINGANAGAR, ODISHA PROJECT: BTG PACKAGE FOR 1 X 120 MW GAS BASED CAPTIVE POWER PLANT CONSULTANT: FICHTNER CONSULTING ENGINEERS (INDIA) PVT. LTD. INDIA, CHENNAI, BENGALURU						
SL NO	ITEM DESCRIPTION	QTY	UNIT	Weightage w.r.t Overall Price (In %)	HSN/SAC Code	GST (%)
Bidder's Name : <Bidder to indicate> Bidder's Offer No. & Dt. : <Bidder to indicate> Bidder's Ref No. & Dt. : <Bidder to indicate> BHEL Enq. No. & date : <Bidder to indicate>						
I MAIN OFFER [Note:Prices for individual items to be quoted as indicated in the price bid format.]						
A	MATERIAL SUPPLY:PUMP & MOTOR FOR OILY WASTE WATER COLLECTION PIT FOR STG AREA WITH REQUIRED ACCESSORIES AS PER SPECIFICATION, COMMISSIONING SPARE AND SPECIAL TOOL AND TACKLES[Material code: PY9751565030]			1		
A.1	Pump & Motor for Oily Waste Water Collection Pit for STG Area with required accessories inline with requirements mentioned in specification including commissioning spare and special tool and tackles. Note: i) Pump & Motor for Oily Waste Water Collection Pit for STG Area (weather proof) with required accessories. ii) One set of commissioning spares per pump & Motor shall be quoted as per manufacturer's recommendation. 1 set stands for requirement for one no. of pump/drive assembly Bidder to furnish the list along with the offer. (Ref. Note-7) iii) Special tools & tackles for pump and its drive as per manufacturer's recommendations. 1 set stands for requirement for each pump, drive and other accessories. Bidder to furnish the list along with offer.	2	Sets			
Note: i) The word "set" means the quantity required for full replacement of that part in one machine. ii) The word "TYPE" means the Make, Model no., Type, Range, Size/ Length, Rating, Material as applicable iii) Above Quantity/Items are required for each type and rating of Pump/ diesel engine being supplied under the contract						
TOTAL				#REF!		
3 TAXES AND DUTIES: (Packing and Forwarding, Frieght, Insurance, Taxes & Duties as applicable to be quoted below separately for both Supply and E&C)						
(A) For Supply:						
(i) Packing & Forwarding :	In bidder scope	Included in basic price				
(ii) Frieght:	In bidder scope	Included in basic price				
(iii) Insurance:	By BHEL					
(iv) Taxes and Duties	Extra at actuals					
(v) Any other:	shall be included in baisc price of pumps					
(B) For E&C:						
(i) Service Tax:	Extra at actuals					
(ii) Any other:	Included in basic price					
Notes: 1) Bidders should quote the Total Bid Value in both in figures & words in the specified place. 2) Bidders should mention the applicable HSN/SAC code along with GST% against respective line items. 3) Bidders shall not fill/edit/modify anything else in the Price Bid Format. 4) The rates of line items mentioned in the Price Format shall be derived by BHEL by multiplying the Total Bid Value (G) quoted by the Bidder with the Weightage Factor assigned against respective line items. The rate of each item shall be rounded off to the next 1 (one) paisa. 5) The Total Bid Value quoted by the Bidder shall represent the total landed cost for this enquiry and shall include Packing & Forwarding Charges, Freight Charges, and all applicable taxes and duties, other than GST. GST shall be paid extra by BHEL at applicable rates and transit insurance is in BHEL Scope 6) Evaluation shall be done on the basis of total bid value i.e. the total landed cost to BHEL for this enquiry. Loading (if applicable) shall be added to the Total Bid Value for evaluation purpose. 7) The bidders will also provide un-priced price format strictly in the BHEL price format given above, in the techno commercial part of their offers. Bid will be rejected if any other price format is used. Both priced and un-priced price formats to be provided by the bidders shall be signed and stamped copies. 8) Bidder to quote strictly as per BHEL's NIT requirements. 9) Bidder to note that this is a LUMP SUM Turn-Key Order. However (a) Changes to the tender specification during execution of the project for successful operation of the system need to be carried out by bidder and commercial implications if any will be settled suitably. (b) Unit rates quoted by bidder shall be applicable for any changes in BOQ during detailed engineering stage. 10) Main offer consists of those items which will be part of main order after successful bidder is identified. Optional items consists of those items which need to be quoted by bidder but may or may not be ordered by BHEL. Bidders are instructed to provide the pricing details listed under Main offer and Optional items as per the prescribed format. 11) Prices quoted by bidders for items under main offer : Sl. No. I [A] will be considered for evaluation of lowest bidder.However, BHEL reserves the right. (a) To include any of the optional items in scope of supply (as per customer contract requirements) and accordingly consider the same in evaluation. Any such scope increase and change in evaluation will be intimated to vendor during technical evaluation(before price bid opening). (b) To place PO for any of the Optional items with in the contract period. Hence bidders need to mandatorily quote reasonable prices for all optional items considering such requirement and keep the validity of the prices till the end of contract period.						

Annexure-1B

		BHARAT HEAVY ELECTRICALS LIMITED R.C.PURAM, HYDERABAD-502032				
PROJECT ENGINEERING & SYSTEMS DIVISION						
PRICE FORMAT (R00) FOR SUMP PUMP WITH ELECTRIC MOTOR DRIVE FOR OILY WASTE WATER COLLECTION PIT FOR STG AREA CUSTOMER: TATA STEEL LIMITED,KALINGANAGAR, ODISHA PROJECT: BTG PACKAGE FOR 1 X 120 MW GAS BASED CAPTIVE POWER PLANT CONSULTANT: FICHTNER CONSULTING ENGINEERS (INDIA) PVT. LTD. INDIA, CHENNAI, BENGALURU						
SL NO	ITEM DESCRIPTION	QTY	UNIT	Weightage w.r.t Overall Price (In %)	HSN/SAC Code	GST (%)
Bidder's Name : <Bidder to indicate> Bidder's Offer No. & Dt. : <Bidder to indicate> Bidder's Ref No. & Dt. : <Bidder to indicate> BHEL Enq. No. & date : <Bidder to indicate>						
12.a) For all items including Optional items, prices to be furnished in this prescribed price bid format only for each individual item. The price to be quoted against sl no A, B, C shall be Weightage w.r.t Overall Price as mentioned above. No combined prices, common prices or any other format will be accepted and such bids may be liable for rejection. 12 b) Bidder must not change the indicated item description, quantity & units in the price bid format. Bidder should only fill the unit rates & total price. 12 c) Bidder to quote for all the items as per price bid format. Incomplete/partial offer may be liable for rejection.						
13) Bidder to quote the base rates only. All other commercial charges for packing, freight, transportation, insurance, taxes & duties etc., shall be indicated separately.						
14 a.) Commissioning spares are those spares which are required at the time of commissioning and shall be recommended (as per bidders experience) and quoted by bidder. However commissioning spares indicated in the price bid format shall be quoted as minimum. 14.b) Commissioning spare consumed over and above the recommended commissioning spares, during commissioning shall be supplied free of cost by the equipment vendor.						
15)With respect to Mandatory Spares: A) If any of above items indicated by the specified name are not applicable, bidder to offer alternative item serving the same function as per equipment's design and indicate below the item being replaced. B) If bidder is not able to meet the above note, then bidder may mention "Not Applicable". However, if found applicable during detailed engg. stage or alternative item as per equipment design can serve the same function, bidder to supply the specified quantity with out any delivery and commercial implications to BHEL.						
16) Reference document: BHEL Tender Specification (PY51565R01) & all its annexures.						
17) Unpriced price bid format indicating as quoted against each applicable item shall be submitted duly signed & stamped along with technical offer by bidder as a token of concurrence that prices are submitted in this format only. The offer shall be liable for rejection in case if un-priced price bid format is not submitted or any modification is carried out in price bid format.						
18) In case the systems are being supplied from outside India , reputed Third Party Inspection like Lyods or equivalent has to be considered and the charges should be included in the Main offer. For those bidders who are supplying from India, such third party inspection charges need not be considered and same will be arranged by BHEL/BHEL nominated inspection agency.						
19) i) With respect to Supervision charges, prices quoted by bidder shall be considered for L1 bidder evaluation. ii) Bidder to provide total price against sl. no C-1, that include per diem supervision charge including insurance charge of 1 service person (50 % of sl. No. C-1 price) + To and fro Travel expenses (30% sl. No. C-1 price) + 1 day boarding and lodging and local convenience etc charge (20 % sl. No. C-1 price). iii) Referring to Sl no C-1 Supervision charges for Pump /Motor/Engine, For the purpose of Quotation, total no of 1 man days for Pump will be covered in 1 visits have been considered and payment against Sl.No C-1 above shall be made as per the actual number of visits and man days required for the supervision of the complete E&C activities as per these diem rates. Purchase Order for supply of main items, (A to C) shall be placed by BHEL-PE&SD Hyderabad. For Supervision of E&C, LOI & PO shall be placed by PE&SD.						

ESP-001-2A
Rev.00



BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING & SYSTEMS DIVISION
RAMACHANDRAPURAM: HYDERABAD - 502 032)

Std. / Doc. Number

PY 51565

Rev. No.

00

ANNEXURE – 02

(QUALITY PLAN GUIDELINES AND FORMAT)

TD-201 Rev No. 00 Form No.		PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE
			Rev No. 00
			Page 1 of 3
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.	QAP GUIDELINES & FORMAT (ANNEXURE) The QAP format and guidelines for filling up the format shall be used by vendor for preparation and submission of QAP after order placement. Note : 1. Typical /Indicative /Standard QAP(s) for equipment /package attached is reference document and to use by successful bidder in future for preparation and submission of QAP for BHEL /CUSTOMER approval. 2. No deviation to reference document is acceptable.		

Form No.	 HYDERABAD	PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION HYDERABAD	ANNEXURE
			Rev No. 00
			Page 2 of 3
<u>GUIDELINES TO VENDORS FOR PREPARATION OF QUALITY ASSURANCE PLAN</u> - QAP shall be made in landscape mode on A4 size paper as per the format enclosed. Font size shall be minimum 10. - Each page of QAP shall contain the following information. - Vendor's name & address. - Customer: BHEL, Hyderabad. - Project. - BHEL Product Standard Number/revision number as referred in P.O. - BHEL Purchase Order Number & Date. - Product as per P.O. description. - QAP Number (unique and shall not repeat)/revision number/date. - Page number and number of pages - QAP shall contain four parts / stages as follows. - Raw materials and bought out items. - In process Control / Inspection. - Final assembly, Inspection & Testing. - Painting, preservation & packing. - Under 'Component', indicate name of the component (say casing, rotor, pressure gauge, etc). - Under 'Characteristics', indicate appropriately (say chemical analysis, mechanical properties, NDT (UT,DP etc.), hydrostatic test, calibration check etc.) - Under 'Class', indicate minor, major or critical depending on the importance of characteristic. - Under 'Type of check', indicate appropriately (say chemical, mechanical, UT, DP etc.) - Under 'Quantum of check', indicate appropriately (say 100%, 10%, sample, per melt, per heat, all pieces etc.) - Under 'Reference document' and 'Acceptance norms', appropriate National & International standards, BHEL standards, approved drawing references etc. should be indicated. It is not correct to mention as "Vendor's internal standards or Vendor's standard practice etc.". If vendors' internal standards are referred, same shall be in line with BHEL Spec. indicated in the P.O. These may require review & approval by our Engineering dept. - Under 'Format of record', indicate appropriately supplier's test certificate, calibration certificate, lab report, inspection report etc. - Please refer 'Agency' in QAP format. Under P: Perform, W: Witness, V: Verify Indicate against each characteristic 1: (BHEL CQS/Nominated inspection agency), OR 2: (Vendor / Sub vendor)			
Ref. Doc			

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		Rev No. 00		
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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.		Note: Performing agency is normally vendor or his sub vendor (Legend 2). Where witness points are indicated in specification, P.O., Drawing etc., for such operations, Under Witness (W) column use 1. Under 'Verify' column, use code 1. 12. Under 'D' please put (☐ Tick) against each characteristic where vendor proposes to submit test certificate/report etc. OR as required as per BHEL Specification. 13. Vendor's signature & stamp should be available on each page of QAP. 14. Vendor should read the BHEL Product Standard thoroughly and QAP should be made only inline and relevant to the Specification & Approved Drawings. 15. The following operations/characteristics/check points may be included (AS APPROPRIATE) a) Visual check b) Dimensional check c) Mechanical and Chemical properties. d) Surface preparation before painting (by chemical cleaning, sand blasting, shot blasting etc. as the case may be.) e) Painting check for shade, Dry Film Thickness (DFT), Adhesion/ peel off test etc. f) Check for correctness for all components mounted as per General arrangement Drawing, Bill Of Materials (BOM), etc. for range, rating, make, color, size, location as per GA, quantity, label description including tag nos., annunciator facia, loose components, accessories, spares etc. g) Verification of test certificate for protection class for the enclosures. h) Mechanical functioning of switches. i) Continuity of earthing and provision of earth points. j) Colour coding of wiring, size, tightness & dressing of wiring. k) Review of test certificates of assembled items, raw materials, internal test reports etc. l) Witness of functional checks, which may include mechanical run & electrical run, H.V.test, IR measurement, Electrical and Mechanical tests etc. m) PQR, WPS, Welder Qualification Record, welding records (fit up, DP) etc. n) Material identification (for punch marks of serial numbers, Heat No, Melt No, Inspector's stamp etc.) o) Hydraulic Pressure Test, Pneumatic Pressure Test, Liquid Penetration Examination and other Non-Destructive Tests. p) Tests on Galvanised items (Visual, Hammer Test, Knife Test, Thickness, Pierce Test (Copper sulphate test), Hydrogen evaluation test, Stripping test (for Mass of Zinc coating) q) All tests as per BHEL Product Standard & approved drawings including Type tests and Routine tests on individual items and on System as a whole. r) Packing and Preservation. 16. QAP Format enclosed. 17. Typical Manufacturing QAP(s) is /are attached.		
		Ref. Doc		

VENDOR'S NAME & ADDRESS:			MANUFACTURING QUALITY PLAN						QP. NO.:				
			CUSTOMER: BHEL, HYDERABAD – 32.			BHEL P.O.NO.:			REV NO:		DATE:		
			PROJECT: PRODUCT:			P.O.DATE: BHEL SPEC:			REV:		PAGE 1 OF 1		
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY P W V			REMARKS
1.0	RAW MATERIALS & BOUGHT OUT ITEMS												
2.0	INPROCESS INSPECTION												
3.0	FINAL INSPECTION & TESTING												
4.0	PRESERVATION & PACKING												

VENDOR TO NOTE: THIS FORMAT IS IN MICROSOFT WORD. HEADER & FOOTER SHALL BE AVAILABLE IN EACH PAGE OF QP. QP SHALL BE IN LANDSCAPE & A4 SIZE ONLY. FONT SIZE SHALL BE MIN 10. VENDOR SHALL SIGN & STAMP IN EACH PAGE OF QP. LOI REF. & DATE ARE NOT ACCEPTABLE. P.O.NO. & DATE SHALL BE INDICATED. QP NO. SHOULD BE UNIQUE AND SHALL NOT REPEAT. ALL THE TESTS / CHECKS INDICATED IN THE BHEL SPEC. SHALL BE INDICATED IN THE QP.

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) & 2 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	BHEL QA SIGNATURE & STAMP	CUSTOMER'S SIGNATURE & STAMP

बी एच डी एल BHEL		TYPICAL MANUFACTURING QUALITY PLAN						MQP. NO.:					
		PROJECT ENGINEERING & SYSTEMS DIVISION BHEL, RC PURAM, HYD-502032			PROJECT: PACKAGE: CENTRIFUGAL PUMP BHEL TECH SPEC:			REV NO:		DATE:			
								PAGE 1 OF 4					
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY P W V			REMARKS
1.0	RAW MATERIALS & BOUGHT OUT ITEMS												
1.1	Casing	Chemical & Mech. Properties	Major	Chemical & Mech. analysis	1 per heat/lot	Tech Spec/ Approved Datasheet/ Approved Drawing		MTC	√	2	2	1	
1.2		Heat treatment *	Major	Heat treatment	100%			HT chart / TC	√	2	2	1	* for castings
1.3	Impeller, Diffuser, shaft	Chemical & Mech. Properties	Major	Chemical & Mech. analysis	1 per heat/lot			MTC	√	2	2	1	
1.4	Mechanical seal	Material and leakage check (Air test)	Major	OEM's certificate review	100%			MTC / COC	√	2	2	1	
1.5	Bearing and bearing housing	Make and Model	Major	Visual	100%			MTC / COC	√	2	2	1	
1.6	Accessories * (coupling and coupling guards, inter connecting piping, strainers, instruments, JB etc.)	Chemical & Mech. Properties	Major	Chemical & Mech. Analysis	1 per heat/lot			MTC	√	2	2	1	* accessories as per scope of supply
1.7		MOC, hydro test reports, Calibration reports and Type test certificates for instruments.	Major	OEM's certificate review	100%			OEM test certificates or COC	√	2	2	1	
1.8	Wear rings	Chemical & Mech. Properties and hardness	Major	Chemical & Mech. Analysis and hardness test	1 per heat/lot					MTC	√	2	2

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) & 2 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.

बी एच ई एल 		TYPICAL MANUFACTURING QUALITY PLAN						MQP. NO.:					
		PROJECT ENGINEERING & SYSTEMS DIVISION BHEL, RC PURAM, HYD-502032			PROJECT: PACKAGE: CENTRIFUGAL PUMP BHEL TECH SPEC:			REV NO:		DATE:			
								PAGE 2 OF 4					
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY P W V			REMARKS
1.9	Gaskets, Flanges, and Fasteners	Chemical & Mech. Properties	Minor	Chemical & Mech. Analysis	1 per heat/lot			MTC	√	2	2	1	
2.0	INPROCESS INSPECTION												
2.1	Fabrication of casing and other components	WPS, PQR and WQR	Major	Document verification	100%	Tech Spec/ Approved Datasheet/ Approved Drawing		WPS, PQR and WQR	--	2	2	1	
2.2	Fillet welds on pressure containing components *	NDE	Major	MPI or LPI (when MPI is not feasible)	100%			NDE reports	√	2	2	1	* if any
2.3	Nozzle weld and butt weld joints on pressure containing components *	NDE	Major	RT or UT (when RT is not feasible)	100%			NDE reports	√	2	2	1	* if any
2.4	Casing	Surface finish & NDE	Major	Visual & DPT/MPI	100%			NDE reports	√	2	2	1	
2.5		Leakage	Critical	Hydro test	100%			Test reports	√	2	1	--	
2.6	Impeller, Diffuser and Shaft (if shaft > 50 mm diameter)	NDE	Major	For impeller/ diffuser DPT/MPI and for Shaft UT	100%			NDE reports	√	2	2	1	

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) & 2 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.

		TYPICAL MANUFACTURING QUALITY PLAN						MQP. NO.:					
		PROJECT ENGINEERING & SYSTEMS DIVISION BHEL, RC PURAM, HYD-502032				PROJECT: PACKAGE: CENTRIFUGAL PUMP BHEL TECH SPEC:		REV NO:		DATE:			
								PAGE 3 OF 4					
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY P W V			REMARKS
2.7	Wear rings	NDE	Major	DPT	100%			DP reports	√	2	2	1	
2.8	Impeller	Dynamic balancing	Critical	Balancing	100%			IR	√	2	2	1	
3.0	FINAL INSPECTION & TESTING												
3.1	Pump Assembly with job motor	Performance test	Critical	Testing	100%	Tech Spec/ Approved Datasheet/ Approved Drawing		TC	√	2	1	--	Only 10% witness by BHEL / BHEL's TPIA, subjective to minimum 1 pump of each size & type.
3.2		NPSH (if applicable)	Major	Testing	100%			TC	√	2	1	--	
3.3		Mechanical run test	Critical	Testing	100%			TC	√	2	1	--	
3.4		Strip Examination	Critical	Dismantling	100%			TC	√	2	1	--	
3.5		Overall Dimensions	Major	Measurement	100%			IR	√	2	1	--	
3.6		String test / complete unit test	Major	Testing	100%			IR	√	2	1	--	
3.7		Spares (if any)	Major	BOM check	100%			IR	√	2	1	--	
4.0	PRESERVATION & PACKING												
4.1	Pump and its components	Direction of rotation, Stamping and Painting	Major	Visual, Shade & DFT	Random	Tech Spec/ Approved Datasheet/ Approved Drawing		IR	√	2	1	--	
4.2		Packing #	Major	Visual	100%			Packing List	√	2	2	1	# Seaworthy packing for export orders

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) & 2 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.

		TYPICAL MANUFACTURING QUALITY PLAN						MQP. NO.:						
								REV NO:		DATE:				
		PROJECT ENGINEERING & SYSTEMS DIVISION BHEL, RC PURAM, HYD-502032			PROJECT: PACKAGE: CENTRIFUGAL PUMP BHEL TECH SPEC:			PAGE 4 OF 4						
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	*	D	AGENCY P W V			REMARKS

Notes:-

1. This MQP should be read along with specification ((Latest revisions to be considered as per PO), approved drawings & approved datasheet.
2. Specification/drawing/datasheet shall prevail over quality plan for contradiction if any.
3. Any project/customer specific requirements which shall be notified have to be fulfilled by the vendor at the time of execution of order.

Abbreviations:-

MTC	–	Material Test certificate	COC	–	Certificate of Compliance	DFT	–	Dry Film Thickness
TC	–	Test Certificate	NDE	–	Non Destructive Examination	IR	–	Inspection Report
DFT	–	Dry Film Thickness	IBR	–	Indian Boiler Regulations	IS	–	Indian Standards

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) & 2 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.

		TYPICAL MANUFACTURING QUALITY PLAN						MQP. NO.:					
								REV NO:		DATE:			
		PROJECT ENGINEERING & SYSTEMS DIVISION BHEL, RC PURAM, HYD-502032			PROJECT: PACKAGE: LT MOTOR BHEL TECH SPEC:			PAGE 1 OF 4					
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY			REMARKS
										P	W	V	
1.0 RAW MATERIALS & BOUGHT OUT ITEMS													
1.1	<u>COPPER WIRE</u> Enameled Copper Wire	Overall diameter, elongation, Mandrel winding test, Peel test, springiness, Abrasion test, Cut through test, Heat shock test, Continuity test	Major	Measurement and mechanical & electrical testing	One sample per heat/lot	National & international standard (IS or IEC) / technical specification/ approved drawing/ datasheet		IR / supplier test certificate	√	2	2	1	
1.2	<u>STEEL SHAFT</u> Straightened Steel bar in black Finish	Dimensions, surface finish, chemical composition	Major	Visual, measurement and chemical testing	One sample per heat/lot			supplier test certificate	√	2	2	1	
1.3		NDT	Major	UT	100%			supplier test certificate	√	2	2	1	
1.4	<u>ALUMINIUM INGOTS</u>	Chemical properties	Major	Chemical testing	One sample per heat/lot			supplier test certificate	√	2	2	1	
2.0 INPROCESS INSPECTION													
2.1	ASSEMBLY	Completeness and correctness of assembly	Major	Visual verification	100%	MO and manufacturer's internal processes		Log book	--	2	2	2	

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) & 2 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.

बी एच ई एल BHEL		TYPICAL MANUFACTURING QUALITY PLAN						MQP. NO.:					
		PROJECT ENGINEERING & SYSTEMS DIVISION BHEL, RC PURAM, HYD-502032			PROJECT: PACKAGE: LT MOTOR BHEL TECH SPEC:			REV NO:		DATE:			
								PAGE 2 OF 4					
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY P W V			REMARKS
3.0	FINAL INSPECTION & TESTING												
3.1	ROUTINE TESTING	Measurement of winding resistance in cold condition	Major	Testing	100%	National & international standard (IS or IEC) / technical specification		TC	√	2	1	--	
3.2		SH heater resistance (if applicable)	Major	Testing	100%			TC	√	2	1	--	
3.3		Insulation resistance (before and after HV test)	Major	Testing	100%			TC	√	2	1	--	
3.4		High voltage test at 1.8 KV for 1 minute and space heater HV test	Major	Testing	100%			TC	√	2	1	--	
3.5		Direction of rotation	Major	Testing	100%			TC	√	2	1	--	
3.6		No load test (measurement of NL A, voltage, NL power and NL RPM)	Major	Testing	100%			TC	√	2	1	--	
3.7		Reduced run up voltage test at (rated volt√3)	Major	Testing	100%100%			TC	√	2	1	--	
3.8		Locked rotor test at full load current	Major	Testing	100%			TC	√	2	1	--	
3.9		Vibration measurement	Major	Testing	100%			TC	√	2	1	--	
3.10		Measurement of noise level	Major	Testing	100%			TC	√	2	1	--	
3.11		120% over speed test	Major	Testing	100%			TC	√	2	1	--	

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		TYPICAL MANUFACTURING QUALITY PLAN						MQP. NO.:					
		PROJECT ENGINEERING & SYSTEMS DIVISION BHEL, RC PURAM, HYD-502032			PROJECT: PACKAGE: LT MOTOR BHEL TECH SPEC:			REV NO:		DATE:			
								PAGE 3 OF 4					
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY P W V			REMARKS
3.12	TYPE TESTS	Measurement of winding resistance in cold condition	Major	Testing	One /rating	National & international standard (IS or IEC) / technical specification		TC	√	2	--	1	Verification of Identical Type test Report of same Rating
3.13		Temp. rise test at full load (load point for 100%, 75% & 50% load (full load, ¾ and ½ load)	Major	Testing	One /rating			TC	√	2	--	1	
3.14		160% momentary overload test	Major	Testing	One /rating			TC	√	2	--	1	
3.15		Locked rotor amp and torque test	Major	Testing	One /rating			TC	√	2	--	1	
3.16		No load test	Major	Testing	One /rating			TC	√	2	--	1	Identical type test reports for motor ratings (not more than 5 years old) will be provided.
3.17		Reduced voltage running up test	Major	Testing	One /rating			TC	√	2	--	1	
3.18		Insulation resistance test (before and after HV test)	Major	Testing	One /rating			TC	√	2	--	1	
3.19		HV test – 1.8 KV for winding and 1.5 KV for space heater	Major	Testing	One /rating			TC	√	2	--	1	
3.20		Vibration test	Major	Testing	One /rating			TC	√	2	--	1	
3.21		120% over speed test	Major	Testing	One /rating			TC	√	2	--	1	

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		TYPICAL MANUFACTURING QUALITY PLAN						MQP. NO.:						
								REV NO:		DATE:				
		PROJECT ENGINEERING & SYSTEMS DIVISION BHEL, RC PURAM, HYD-502032						PROJECT: PACKAGE: LT MOTOR BHEL TECH SPEC:				PAGE 4 OF 4		
SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	*	D	AGENCY P W V			REMARKS
4.0 PRESERVATION & PACKING														
		Painting*, (Shade, DFT,) Marking	Major	Visual, DFT	Random	Technical specification/ approved drawing/datasheet	TC	√	2	--	1			
		Packing*	Major	Visual	Random		Packing List	√	2	--	--			

Notes:-

- This MQP should be read along with specification ((Latest revisions to be considered as per PO), approved drawings & approved datasheet.
- Specification/drawing/datasheet shall prevail over quality plan for contradiction if any.
- Any project/customer specific requirements which shall be notified have to be fulfilled by the vendor at the time of execution of order.

Abbreviations:-

MTC	–	Material Test certificate	COC	–	Certificate of Compliance	DFT	–	Dry Film Thickness
TC	–	Test Certificate	NDE	–	Non Destructive Examination	IR	–	Inspection Report
DFT	–	Dry Film Thickness	IBR	–	Indian Boiler Regulations	IS	–	Indian Standards

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ESP-001-2A

Rev.00



BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING & SYSTEMS DIVISION
RAMACHANDRAPURAM: HYDERABAD - 502 032)

Std. / Doc. Number

PY 51565

Rev. No.

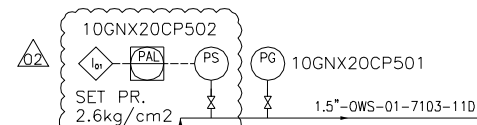
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ANNEXURE – 03
(P&ID FOR OILY WATER SEPARATOR
SYSTEM)

10-6801-111W-3-M111-1039-01

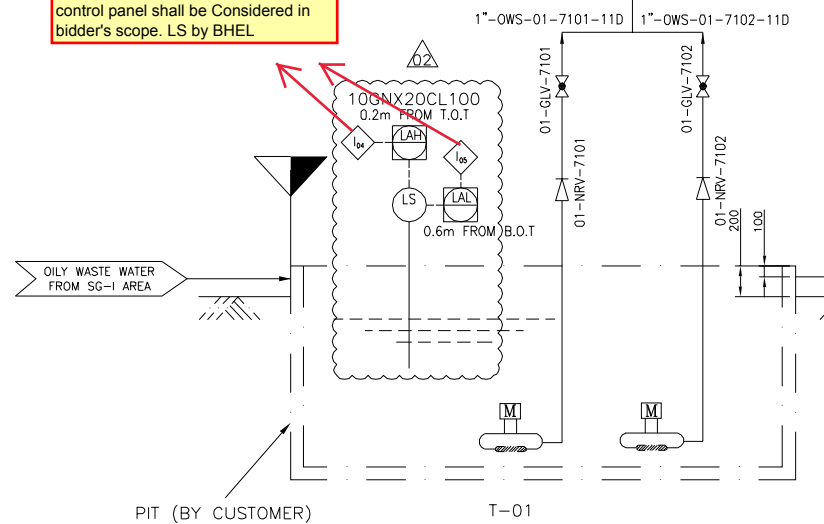
DRG. NO.

SH. 01 OF 01

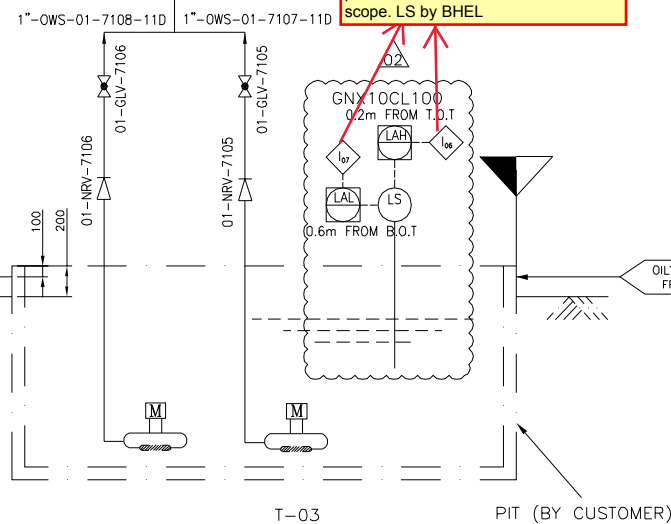
SPARE CONNECTION
1.5"-OWS-01-7116-11D

I04 & I05 shall be executed through Control Panel supplied by Bidder. Hence Provision of the same in control panel shall be Considered in bidder's scope. LS by BHEL.

I06 & I07 shall be executed through Control Panel supplied by Bidder. Hence Provision of the same in control panel shall be Considered in bidder's scope. LS by BHEL.



1.5"-OWS-01-7110-11D



OILY WASTE WATER COLLECTION RCC PIT
2.0M X 2.0M X 1.5M INCLUDING FREE BOARD
SUBMERSIBLE PUMPS OF 2.5M³/Hr @ 30 MLC

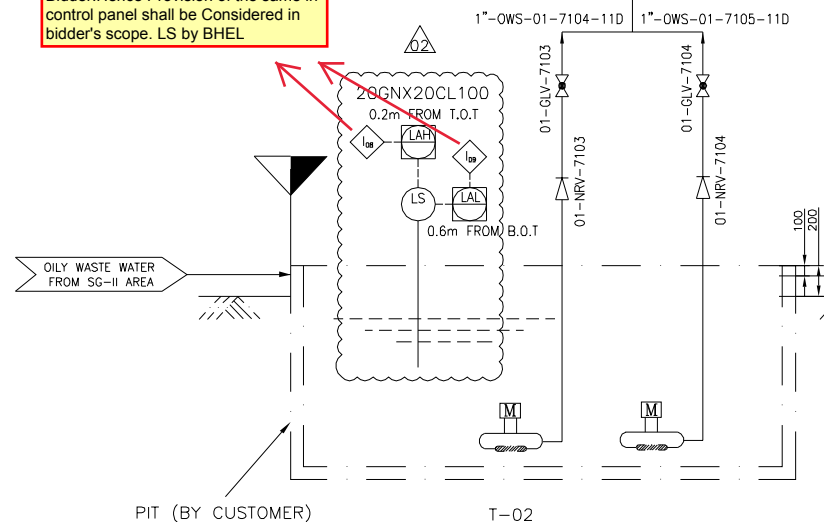
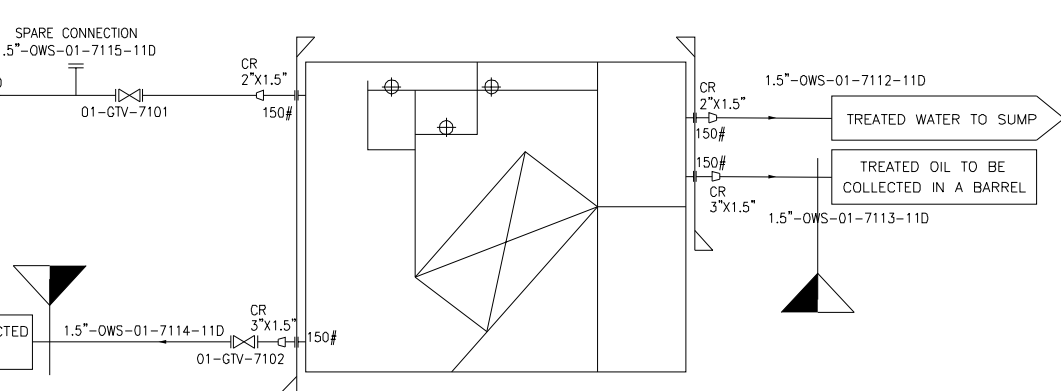
OILY WASTE WATER COLLECTION RCC PIT
2.0M X 2.0M X 1.5M INCLUDING FREE BOARD
SUBMERSIBLE PUMPS OF 2.5M³/Hr @ 40 MLC

NOTES:

- MANHOLE TO BE PROVIDED IN THE OILY WASTE WATER PIT FOR MAINTENANCE PURPOSES.
- TILTED PLATE INTERCEPTOR TO BE PLACED AT ELEVATION TO ENSURE THE OIL AND SLUDGE SHALL BE COLLECTED IN A BARREL FOR FURTHER DISPOSAL.
- THE PUMPS' DISCHARGE HEADERS ARE SIZED FOR TWO PUMP OPERATION.

B.O.T - BOTTOM OF TANK
T.O.T - TOP OF TANK

I08 & I09 shall be executed through Control Panel supplied by Bidder. Hence Provision of the same in control panel shall be Considered in bidder's scope. LS by BHEL.

SPARE CONNECTION
1.5"-OWS-01-7115-11D

OILY WASTE WATER COLLECTION RCC PIT
2.0M X 2.0M X 1.5M INCLUDING FREE BOARD
SUBMERSIBLE PUMPS OF 2.5M³/Hr @ 30 MLC

OILY WASTE WATER COLLECTION RCC PIT
2.0M X 2.0M X 1.5M INCLUDING FREE BOARD
SUBMERSIBLE PUMPS OF 2.5M³/Hr @ 30 MLC

SCOPE OF SUPPLY

BHEL CUSTOMER

BHEL VENDOR

CONSULTANT:
FICHTNER Consulting Engineers (India) Private Limited
Chennai, Bengaluru



TATA STEEL LIMITED
KALINGANAGAR, ODISHA

AREA BOP PACKAGE FOR 1 x 120 MW GAS BASED
CAPTIVE POWER PLANT

DEPT MECHANICAL/LAYOUT

DETAIL P&ID OF OILY WATER SEPARATOR SYSTEM

TATA DRG. NO.

PID-23-02-13-01-291-071

REV
02

NAME	SIGN.	DATE	NO. OF VAR.
DRN. CH.P	--	14.05.19	N.A.
CHD. AKS	--	14.05.19	N.A.
APPD. M.S.S.N	--	14.05.19	N.A.
DEPT. XXXX	GR	9/M/19	
CODE XXX			
TITLE	P&ID OF OILY WATER SEPARATOR SYSTEM		
CARD CODE			
DRAWING NO.	PY-DP-3-M111-1039-01		
SHT. No	01	NO. OF SHT.	01

REV.	DATE	ALTERED	CH.P	REV.	DATE	ALTERED	CH.P
02	29.09.19	CHD/APPD	AKS	01	05.09.19	CHD/APPD	AKS
ZONE				ZONE			
1				2			
3				4			
5				6			
7				8			