

Enq SI No	Materialcode	Description	Lot no	Qty	Unit	Dely dt	Destination	Bidder's Response
1	RFW803320001	GYPSUM BLEED PUMP WITH MOTOR, HEAD 40M, FLOW 180M3/HR WITH ALL ACCESSORIES AS PER SPEC, NORTH KARANPURA:FGD: SLP:R00	1	6	NO	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
2	RFW803320002	EMERGENCY TRANSFER PUMP WITH MOTOR HEAD 25M, FLOW 660 M3/HR, WITH ALL ACCESSORIES AS PER SPEC NORTH KARANPURA:FGD: SLP:R00	1	3	NO	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
3	RFW803320003	FILTRATE WATER PUMP WITH MOTOR HEAD 35M , FLOW 520 M3/HR, WITH ALL ACCESSORIES AS PER SPEC NORTH KARANPURA:FGD: SLP:R00	1	2	NO	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
4	RFW803320004	SECONDARY HYDROCYCLONE FEED TANK PUMP WITH MOTOR HEAD 45M, FLOW 312 M3/HR WITH ALL ACCESSORIES AS PER SPEC NORTH KARANPURA:FGD:SLP:R00	1	2	NO	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
5	RFW803320005	WASTE WATER PUMP WITH MOTOR HEAD 70M, FLOW 140 M3/HR, WITH ALL ACCESSORIES AS PER SPEC NORTH KARANPURA:FGD: SLP:R00	1	2	NO	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
6	RFW803320006	LIMESTONE SLURRY FEED PUMP WITH MOTOR HEAD 55M, FLOW 90M3/HR WITH ALL ACCESSORIES AS PER SPEC NORTH KARANPURA:FGD:SLP:R00	1	6	NO	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
7	RFW803320007	AUXILIARY ABSORBENT PUMP WITH MOTOR HEAD 25M , FLOW 210 M3/HR WITH ALL ACCESSORIES AS PER TECH SPEC NORTH KARANPURA:FGD:SLP:R00	1	2	NO	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
8	RFW803320008	PRIMARY HYDRO CYCLONE FEED TANK PUMP WITH MOTOR HEAD 55M, FLOW 540 M3/HR WITH ALL ACCESSORIES AS PER SPEC NORTH KARANPURA:FGD:SLP:R00	1	2	NO	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
9	RFW803320009	ABSORBER AREA DRAIN SUMP PUMP WITH MOTOR HEAD 30M, FLOW 210 M3/HR, WITH ALL ACCESSORIES AS PER TECH SPEC NORTH KARANPURA:FGD:SLP:R00	1	6	NO	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
10	RFW803320010	GYPSUM AREA DRAIN SUMP PUMP WITH MOTOR HEAD 25M , FLOW 50 M3/HR WITH ALL ACCESSORIES AS PER TECH SPEC NORTH KARANPURA:FGD:SLP:R00	1	2	NO	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
11	RFW803320011	LIMESTONE AREA DRAIN SUMP PUMP WITH MOTOR HEAD 25M FLOW 50 M3/HR WITH ALL ACCESSORIES AS PER TECH SPEC NORTH KARANPURA:FGD:SLP:R00	1	2	NO	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
12	RFW803320012	SUPERVISION OF ERECTION & COMMISSIONING -1ST VISIT OF 15 DAYS - FOR SLURRY PUMPS AS PER TECH SPEC OF NORTH KARANPURA:FGD: SLP:R00	1	1	ST	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
13	RFW803320013	SUPERVISION OF ERECTION & COMMISSIONING -2ND VISIT OF 15 DAYS - FOR SLURRY PUMPS AS PER TECH SPEC OF NORTH KARANPURA:FGD: SLP:R00	1	1	ST	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
14	RFW803320014	SUPERVISION OF ERECTION & COMMISSIONING -3RD VISIT OF 15 DAYS - FOR SLURRY PUMPS AS PER TECH SPEC OF NORTH KARANPURA:FGD: SLP:R00	1	1	ST	30-Sep-19	STORES /NTPC NORTH KARANPURA /JHARKHAND	
15	RFW803420001	IMPELLER ASSEMBLY - 2 NO OF EACH TYPE	1	1	ST	24-Dec-20	STORES/BHEL/RANIPET	
16	RFW803420002	CASING LINERS - 3 NOS. OF EACH TYPE	1	1	ST	24-Dec-20	STORES/BHEL/RANIPET	
17	RFW803420003	SEALS- 3 SETS. OF EACH TYPE	1	1	ST	24-Dec-20	STORES/BHEL/RANIPET	
18	RFW803420004	BEARINGS - 3 NOS OF EACH TYPE	1	1	ST	24-Dec-20	STORES/BHEL/RANIPET	
19	RFW803420005	MOTOR - 1 NO. OF EACH TYPE	1	1	ST	24-Dec-20	STORES/BHEL/RANIPET	
20	RFW803420006	MOTOR PUMP COUPLING - 3 NOS OF EACH TYPE	1	1	ST	24-Dec-20	STORES/BHEL/RANIPET	

Enq sno	Material code	Item Description	Qty	Unit	Quoted Currency	Exchange Rate	Unit Rate in Quoted Currency	Unit rate in INR	Total rate in INR
1	RFW803320001	GYPSUM BLEED PUMP WITH MOTOR, HEAD 40M, FLOW 180M3/HR WITH ALL ACCESSORIES AS PER SPEC, NORTH KARANPURA:FGD: SLP:R00	6	NO					
2	RFW803320002	EMERGENCY TRANSFER PUMP WITH MOTOR HEAD 25M, FLOW 660 M3/HR, WITH ALL ACCESSORIES AS PER SPEC NORTH KARANPURA:FGD: SLP:R00	3	NO					
3	RFW803320003	FILTRATE WATER PUMP WITH MOTOR HEAD 35M , FLOW 520 M3/HR, WITH ALL ACCESSORIES AS PER SPEC NORTH KARANPURA:FGD: SLP:R00	2	NO					
4	RFW803320004	SECONDARY HYDROCYCLONE FEED TANK PUMP WITH MOTOR HEAD 45M, FLOW 312 M3/HR WITH ALL ACCESSORIES AS PER SPEC NORTH KARANPURA:FGD:SLP:R00	2	NO					
5	RFW803320005	WASTE WATER PUMP WITH MOTOR HEAD 70M,FLOW 140 M3/HR, WITH ALL ACCESSORIES AS PER SPEC NORTH KARANPURA:FGD: SLP:R00	2	NO					
6	RFW803320006	LIMESTONE SLURRY FEED PUMP WITH MOTOR HEAD 55M, FLOW 90M3/HR WITH ALL ACCESSORIES AS PER SPEC NORTH KARANPURA:FGD:SLP:R00	6	NO					
7	RFW803320007	AUXILIARY ABSORBENT PUMP WITH MOTOR HEAD 25M , FLOW 210 M3/HR WITH ALL ACCESSORIES AS PER TECH SPEC NORTH KARANPURA:FGD:SLP:R00	2	NO					
8	RFW803320008	PRIMARY HYDRO CYCLONE FEED TANK PUMP WITH MOTOR HEAD 55M, FLOW 540 M3/HR WITH ALL ACCESSORIES AS PER SPEC NORTH KARANPURA:FGD:SLP:R00	2	NO					
9	RFW803320009	ABSORBER AREA DRAIN SUMP PUMP WITH MOTOR HEAD 30M, FLOW 210 M3/HR, WITH ALL ACCESSORIES AS PER TECH SPEC NORTH KARANPURA:FGD:SLP:R00	6	NO					
10	RFW803320010	GYPSUM AREA DRAIN SUMP PUMP WITH MOTOR HEAD 25M , FLOW 50 M3/HR WITH ALL ACCESSORIES AS PER TECH SPEC NORTH KARANPURA:FGD:SLP:R00	2	NO					
11	RFW803320011	LIMESTONE AREA DRAIN SUMP PUMP WITH MOTOR HEAD 25M FLOW 50 M3/HR WITH ALL ACCESSORIES AS PER TECH SPEC NORTH KARANPURA:FGD:SLP:R00	2	NO					
12	RFW803320012	SUPERVISION OF ERECTION & COMMISSIONING -1ST VISIT OF 15 DAYS - FOR SLURRY PUMPS AS PER TECH SPEC OF NORTH KARANPURA:FGD: SLP:R00	1	ST					
13	RFW803320013	SUPERVISION OF ERECTION & COMMISSIONING -2ND VISIT OF 15 DAYS - FOR SLURRY PUMPS AS PER TECH SPEC OF NORTH KARANPURA:FGD: SLP:R00	1	ST					
14	RFW803320014	SUPERVISION OF ERECTION & COMMISSIONING -3RD VISIT OF 15 DAYS - FOR SLURRY PUMPS AS PER TECH SPEC OF NORTH KARANPURA:FGD: SLP:R00	1	ST					
15	RFW803420001	IMPELLER ASSEMBLY - 2 NOS OF EACH TYPE	1	ST					
16	RFW803420002	CASING LINERS - 3 NOS. OF EACH TYPE	1	ST					
17	RFW803420003	SEALS- 3 SETS. OF EACH TYPE	1	ST					
18	RFW803420004	BEARINGS - 3 NOS OF EACH TYPE	1	ST					
19	RFW803420005	MOTOR - 1 NO. OF EACH TYPE	1	ST					
20	RFW803420006	MOTOR PUMP COUPLING - 3 NOS OF EACH TYPE	1	ST					

TECHNICAL SPECIFICATION

FOR

SLURRY PUMPS

CONFIDENTIAL

CUSTOMER : NTPC
PROJECT : NORTH KARANPURA 3x660MW
APPLICATION : FLUE GAS DESULPHURIZATION SYSTEM



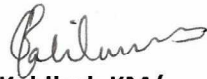
BHARAT HEAVY ELECTRICALS LIMITED
(A GOVT OF INDIA UNDERTAKING)
Flue Gas Desulphurization Group
Ranipet



TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)

NORTH KARANPURA:FGD:SLP:R00

TECHNICAL SPECIFICATION FOR SLURRY PUMPS

Prepared	Checked	Approved
 Ashish Kushwaha, Dy.Mgr-FGD	 Kabilash KM/ S.Engr-FGD  Naveen Reddy, Mgr-FGD	J K Bisoi AGM- FGD 
Revision – 00 Dated 10-05-19	COMMENTS : -----	

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TECHNICAL SPECIFICATION OF SLURRY PUMP NTPC-NORTH KARANPURA (3X660 MW)

NORTH KARANPURA:FGD:SLP:R00

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**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

NORTH KARANPURA:FGD:SLP:R00

1.0 PROJECT INFORMATION:

North Karanpura Super Thermal Power Project (3x660 MW) is located in Hazaribagh and Chatra districts of Jharkhand State. The capacity of the project is 1980 MW comprising of three (3) units of 660 MW each

a.	Owner	NTPC
b.	Buyer	BHEL, Ranipet
c.	Process/Application	Flue Gas Desulphurization

A) SITE CONDITIONS

Guarantee point

1.	Ambient Temperature and Relative Humidity		
	Ambient Temperature (Guarantee)	:	27 deg C
	Relative Humidity	:	60 %

Design point

2.	Ambient Temperature and Relative Humidity		
	Ambient Temperature (Design)	:	45 deg C
	Relative Humidity	:	60 %

Note:

- 1) Guarantee point shall apply for the Guarantee Values as well as for the Guarantee test/Performance test
- 2) Equipment and Material must be suitable for the range of ambient site conditions.

B) PROJECT LOCATION AND APPROACH

The power project is proposed to be located near Tandwa town in Chatra districts in the state of Jharkhand on Hazaribagh-Chatra State highway at a distance of about 50 kms from Hazaribagh city.

a.	State/Division	Jharkhand
b.	District	Chatra



TECHNICAL SPECIFICATION OF SLURRY PUMP NTPC-NORTH KARANPURA (3X660 MW)

NORTH KARANPURA:FGD:SLP:R00

2.0 APPLICABLE CODES & REGULATIONS

The design and materials shall conform to the requirements of applicable codes and regulations of the latest edition. The design, manufacture, installation and testing of the pump shall follow the latest applicable Indian/International (ASME/EN/Japanese) Standards. GB standards are not acceptable. In general, pumps shall conform to latest edition of the following standards

- IS: 1520: Horizontal centrifugal pumps for clear cold fresh water
- IS: 5120: Technical requirements of rotor dynamic special purpose pumps
- API:610: Centrifugal pumps for general refinery service
- IS:5639: Pumps handling chemicals & corrosion liquids
- IS:5659: Pumps for process water
- HIS: Hydraulic Institute Standards USA
- ASTM-1-165-65: Standard methods for Liquid Penetration Inspection

3.0 INTENT OF SPECIFICATION

This specification covers the minimum requirements for the complete design, material, manufacturing, shop inspection, performance testing at the manufacturer's works, delivery at site, supervision of erection & performance testing at site of Slurry pumps along with accessories which is furnished in the Flue Gas Desulphurization plant of NORTH KARANPURA 3x660 MW FGD system. The following points may be noted.

- a. There are 3 units of each 660 MW and each unit is envisaged with one FGD system. Slurry pumps are required for various application the details of which are given in clause-5.0.
- b. Bidder shall assume full unit responsibility for the entire equipment assembly and make all possible efforts to comply strictly with the requirements of this specification and other specifications/attachments to inquiry/order.
- c. The Bidder shall offer only proven design which meets the Provenness criteria indicated in the **Annexure-I**. Necessary document evidences as per **Attachment-3K for qualification** shall be submitted along with the bid. If bidder doesn't meet the specified provenness criteria, they are denied to participate in this tender.
- d. In case, deviations are considered essential by the Bidder (after exhausting all possible efforts), the same shall be separately listed in the Bidder's proposal under separate section, titled as "List of Deviations/Exceptions to the Enquiry Document (**Annexure-IV**)".
- e. Any deviation, not listed under the above section, even if reflected in any other portion of the proposal, shall not be considered applicable.
- f. No deviation or exception shall be permitted without the written approval of the purchaser.
- g. Compliance to this specification shall not relieve the Bidder of the responsibility of furnishing equipment and accessories/auxiliaries of proper design, materials and workmanship to meet the specified start up and operating conditions.
- h. In case, the Bidder considers requirement of additional instrumentation, controls, safety devices and any other accessories/auxiliaries essential for safe and satisfactory operation of



TECHNICAL SPECIFICATION OF SLURRY PUMP NTPC-NORTH KARANPURA (3X660 MW)

NORTH KARANPURA:FGD:SLP:R00

the equipment, the same shall be recommended along with reasons in a separate section and include the same in scope of supply.

- i. All accessories, items of work, though not indicated but required to make the system complete for its safe, efficient, reliable and trouble free operation and maintenance shall also be in supplier's scope unless specifically excluded.

4.0 PROVENNESS CRITERIA:

Bidders are required to meet the Qualification Requirement (QR) for Slurry Pumps as per **Annexure-I & submit the Annexure to qualification requirement (Attachment-3K)**. If the bidder doesn't meet the specified provenances criteria, they are denied to participate in this tender.

5.0 TECHNICAL INFORMATION

5.1 Slurry Pump details are as follows:



TECHNICAL SPECIFICATION OF SLURRY PUMP NTPC-NORTH KARANPURA (3X660 MW)

NORTH KARANPURA:FGD:SLP:R00

TABLE-A- HORIZONTAL CENTRIFUGAL PUMPS DETAILS

A.	GYPSUM BLEED PUMP	
S. No	Description	Requirement
1.	Quantity	
	Quantity for Unit-1	2 no's (1W+1S)
	Quantity for Unit-2	2 no's (1W+1S)
	Quantity for Unit-3	2 no's (1W+1S)
	Total	6 no's
2.	Parameters	
	Pump Design capacity	180 m ³ /hr
	Pump discharge Head	40 m H
	Medium to be handled	Gypsum slurry
	Temperature	Normal: 63 Deg C Design: 70 Deg C
	Type of pump	Impeller Centrifugal type
	Nozzle Orientation	End Suction- Top Discharge
	Seal Type	Single Mechanical seal with external flushing
	Duty	Continuous
	Location	Outdoor
	Minimum liquid level in the tank (in m)	1.5 m
	Normal liquid level in the tank (in m)	5.0 m
	Maximum liquid level in the tank (in m)	6.0 m
	Pump efficiency	Minimum 65%
3.	Material	
	Casing	Ductile iron (65-45-12, ASTM A-536) with replaceable rubber liner/ Hi chrome alloy
	Impeller	Hi Chrome (ASTM 532 Grade IIIA) with minimum hardness of 600-650 BHN or superior material
	Shaft	Duplex Stainless steel (DSS2205, ASTM A-890) or equivalent,
	Shaft sleeve	CD4M Cu ASTM A-743 or equivalent with a minimum hardness of-275 BHN
	Base Plate	Carbon steel epoxy coated
4.	Slurry Analysis	
	Slurry to be handled	Gypsum slurry
	Maximum solid particle size	200 mesh (75 micron)
	Normal solid particle size, d50	325 mesh (43 micron)
	Chloride concentration	30,000 ppm (max)
	Hardness of particle	5-7 (Mho scale)
	Slurry concentration	30 wt%
	Sp. Gravity of slurry	1.2
	Viscosity of Pump	0.01 Pa.S
	pH	4-8
	SiO ₂ Content	4 to 6 g/l



TECHNICAL SPECIFICATION OF SLURRY PUMP NTPC-NORTH KARANPURA (3X660 MW)

NORTH KARANPURA:FGD:SLP:R00

TABLE-A- HORIZONTAL CENTRIFUGAL PUMPS DETAILS

B. EMERGENCY TRANSFER PUMP		
S.No	Description	Requirement
1.	Quantity	
	Quantity for Unit-1	1 no
	Quantity for Unit-2	1 no
	Quantity for Unit-3	1 no
	Total	3 no's
2.	Parameters	
	Pump Design capacity	660 m ³ /hr
	Pump discharge Head	25 mH
	Medium to be handled	Gypsum slurry
	Temperature	Normal: 63 Deg C Design: 70 Deg C
	Type of pump	Impeller Centrifugal type
	Nozzle Orientation	End Suction- Top Discharge
	Seal Type	Single Mechanical seal with external flushing
	Duty	Intermittent
	Location	Outdoor
	Minimum liquid level in the tank (in m)	1.5 m
	Normal liquid level in the tank (in m)	5.0 m
	Maximum liquid level in the tank (in m)	6.0 m
	Pump efficiency	Minimum 65%
3.	Material	
	Casing	Ductile iron (65-45-12, ASTM A-536) with replaceable rubber liner/ Hi chrome alloy
	Impeller	Hi Chrome (ASTM 532 Grade IIIA) with minimum hardness of 600-650 BHN or superior material
	Shaft	Duplex Stainless steel (DSS2205, ASTM A-890) or equivalent,
	Shaft sleeve	CD4M Cu ASTM A-743 or equivalent with a minimum hardness of-275 BHN
	Base Plate	Carbon steel epoxy coated
4.	Slurry Analysis	
	Slurry to be handled	Gypsum slurry
	Maximum solid particle size	200 mesh (75 micron)
	Normal solid particle size, d50	325 mesh (43 micron)
	Chloride concentration	30,000 ppm (max)
	Hardness of particle	5-7 (Mho scale)
	Slurry concentration	30 wt%
	Sp. Gravity of slurry	1.2



TECHNICAL SPECIFICATION OF SLURRY PUMP NTPC-NORTH KARANPURA (3X660 MW)

NORTH KARANPURA:FGD:SLP:R00

Viscosity of Pump	0.01 Pa.S
pH	4-8
SiO ₂ Content	4 to 6 g/l

TABLE-A- HORIZONTAL CENTRIFUGAL PUMPS DETAILS

C.	FILTRATE WATER PUMP	
S. No	Description	Requirement
1.	Quantity	
	Quantity for all 3 units	2 no's (1W+1S)
	Total	2 no's
2.	Parameters	
	Pump Design capacity	520 m ³ /hr
	Pump discharge Head	35 m H
	Medium to be handled	Gypsum slurry
	Temperature	Normal: 59.5 Deg C Design: 70 Deg C
	Type of pump	Impeller Centrifugal type
	Nozzle Orientation	End Suction- Top Discharge
	Seal Type	Single Mechanical seal(Flushless)
	Duty	Continuous
	Location	Outdoor
	Minimum liquid level in the tank (in m)	1.3 m
	Normal liquid level in the tank (in m)	6.0 m
	Maximum liquid level in the tank (in m)	6.2 m
	Pump efficiency	Minimum 65 %
3.	Material	
	Casing	Ductile iron (65-45-12, ASTM A-536) with replaceable rubber liner/ Hi chrome alloy
	Impeller	Hi Chrome (ASTM 532 Grade IIIA) with minimum hardness of 600-650 BHN or superior material
	Shaft	Duplex Stainless steel (DSS2205, ASTM A-890) or equivalent,
	Shaft sleeve	CD4M Cu ASTM A-743 or equivalent with a minimum hardness of-275 BHN
	Base Plate	Carbon steel epoxy coated
4.	Slurry Analysis	
	Slurry to be handled	Gypsum slurry
	Maximum solid particle size	200 mesh (75 micron)
	Normal solid particle size, d50	325 mesh (43 micron)
	Chloride concentration	30,000 ppm (max)
	Hardness of particle	5-7 (Mho scale)
	Slurry concentration	12.5 wt%
	Sp. Gravity of slurry	1.1
	Viscosity of Pump	0.004 Pa.S
	pH	4-8
	SiO ₂ Content	4 to 6 g/l



TECHNICAL SPECIFICATION OF SLURRY PUMP NTPC-NORTH KARANPURA (3X660 MW)

NORTH KARANPURA:FGD:SLP:R00

TABLE-A- HORIZONTAL CENTRIFUGAL PUMPS DETAILS

D.	SECONDARY HYDROCYCLONE FEED TANK PUMP	
S. No	Description	Requirement
1.	Quantity	
	Quantity for all 3 units	2 no's (1W+1S)
	Total	2 no's
2.	Parameters	
	Pump Design capacity	312 m ³ /hr
	Pump discharge Head	45 m H
	Medium to be handled	Gypsum slurry
	Temperature	Normal: 63 Deg C Design: 70 Deg C
	Type of pump	Impeller Centrifugal type
	Nozzle Orientation	End Suction- Top Discharge
	Seal Type	Single Mechanical seal(Flushless)
	Duty	Continuous
	Location	Outdoor
	Minimum liquid level in the tank (in m)	1.3 m
	Normal liquid level in the tank (in m)	6.0 m
	Maximum liquid level in the tank (in m)	6.2 m
	Maximum operating speed	Bidder to confirm
	Pump efficiency	Minimum 65%
3.	Material	
	Casing	Ductile iron (65-45-12, ASTM A-536) with replaceable rubber liner/ Hi chrome alloy
	Impeller	Hi Chrome (ASTM 532 Grade IIIA) with minimum hardness of 600-650 BHN or superior material
	Shaft	Duplex Stainless steel (DSS2205, ASTM A-890) or equivalent,
	Shaft sleeve	CD4M Cu ASTM A-743 or equivalent with a minimum hardness of-275 BHN
	Base Plate	Carbon steel epoxy coated
4.	Slurry Analysis	
	Slurry to be handled	Gypsum slurry
	Maximum solid particle size	200 mesh (75 micron)
	Normal solid particle size, d50	325 mesh (43 micron)
	Chloride concentration	30,000 ppm (max)
	Hardness of particle	5-7 (Mho scale)
	Slurry concentration	16.6 wt%
	Sp. Gravity of slurry	1.112
	Viscosity of Pump	0.004 Pa.S
	pH	4-8
	SiO ₂ Content	4 to 6 g/l



TECHNICAL SPECIFICATION OF SLURRY PUMP NTPC-NORTH KARANPURA (3X660 MW)

NORTH KARANPURA:FGD:SLP:R00

TABLE-A- HORIZONTAL CENTRIFUGAL PUMPS DETAILS

E.	WASTE WATER PUMP	
S. No	Description	Requirement
1.	Quantity	
	Quantity for all 3 units	2 no's (1W+1S)
	Total	2 no's
2.	Parameters	
	Pump Design capacity	140 m ³ /hr
	Pump discharge Head	70 m H
	Medium to be handled	Gypsum slurry
	Temperature	Normal: 63 Deg C Design: 70 Deg C
	Type of pump	Impeller Centrifugal type
	Nozzle Orientation	End Suction- Top Discharge
	Seal Type	Single Mechanical seal (Flushless)
	Duty	Continuous
	Location	Outdoor
	Minimum liquid level in the tank (in m)	1.4 m
	Normal liquid level in the tank (in m)	7.4 m
	Maximum liquid level in the tank (in m)	7.6 m
	Pump efficiency	Minimum 65%
3.	Material	
	Casing	Ductile iron (65-45-12, ASTM A-536) with replaceable rubber liner/ Hi chrome alloy
	Impeller	Hi Chrome (ASTM 532 Grade IIIA) with minimum hardness of 600-650 BHN or superior material
	Shaft	Duplex Stainless steel (DSS2205, ASTM A-890) or equivalent,
	Shaft sleeve	CD4M Cu ASTM A-743 or equivalent with a minimum hardness of-275 BHN
	Base Plate	Carbon steel epoxy coated
4.	Slurry Analysis	
	Slurry to be handled	Gypsum slurry
	Maximum solid particle size	200 mesh (75 micron)
	Normal solid particle size, d50	325 mesh (43 micron)
	Chloride concentration	30,000 ppm (max)
	Hardness of particle	5-7 (Mho scale)
	Slurry concentration	3.0 wt%
	Sp. Gravity of slurry	1.023
	Viscosity of Pump	0.003 Pa.S
	pH	4-8
	SiO ₂ Content	4 to 6 g/l



TECHNICAL SPECIFICATION OF SLURRY PUMP NTPC-NORTH KARANPURA (3X660 MW)

NORTH KARANPURA:FGD:SLP:R00

TABLE-A- HORIZONTAL CENTRIFUGAL PUMPS DETAILS

F.	LIMESTONE SLURRY FEED PUMP	
S. No	Description	Requirement
1.	Quantity	
	Quantity for Unit-1	2 no's (1W+1S)
	Quantity for Unit-2	2 no's (1W+1S)
	Quantity for Unit-3	2 no's (1W+1S)
	Total	6 no's
2.	Parameters	
	Pump Design capacity	90 m ³ /hr
	Pump discharge Head	55 m H
	Medium to be handled	Limestone slurry
	Temperature	Normal: 45 Deg C Design: 50 Deg C
	Type of pump	Impeller Centrifugal type
	Nozzle Orientation	End Suction- Top Discharge
	Seal Type	Single Mechanical seal (Flushless)
	Duty	Continuous
	Location	Outdoor
	Minimum liquid level in the tank (in m)	1.2 m
	Normal liquid level in the tank (in m)	14.6 m
	Maximum liquid level in the tank (in m)	14.8 m
	Pump efficiency	Minimum 65%
3.	Material	
	Casing	Ductile iron (65-45-12, ASTM A-536) with replaceable rubber liner/ Hi chrome alloy
	Impeller	Hi Chrome (ASTM 532 Grade IIIA) with minimum hardness of 600-650 BHN or superior material
	Shaft	Duplex Stainless steel (DSS2205, ASTM A-890) or equivalent,
	Shaft sleeve	CD4M Cu ASTM A-743 or equivalent with a minimum hardness of-275 BHN
	Base Plate	Carbon steel epoxy coated
4.	Slurry Analysis	
	Slurry to be handled	Limestone slurry
	Maximum solid particle size	200 mesh (75 micron)
	Normal solid particle size, d50	325 mesh (43 micron)
	Chloride concentration	100 ppm (max)
	Hardness of particle	5-7 (Mho scale)
	Slurry concentration	30 wt%
	Sp. Gravity of slurry	1.2
	Viscosity of Pump	0.03 Pa.S
	pH	5-8
	SiO ₂ Content	4 to 6 g/l



TECHNICAL SPECIFICATION OF SLURRY PUMP **NTPC-NORTH KARANPURA (3X660 MW)**

NORTH KARANPURA:FGD:SLP:R00

TABLE-A- HORIZONTAL CENTRIFUGAL PUMPS DETAILS		
G.	AUXILIARY ABSORBENT PUMP	
S. No	Description	Requirement
1.	Quantity	
	Quantity for all 3 units	2 no's (1W+1S)
	Total	2 no's
2.	Parameters	
	Pump Design capacity	210 m ³ /hr
	Pump discharge Head	25 m H
	Medium to be handled	Gypsum Slurry
	Temperature	Normal: 63 Deg C Design: 70 Deg C
	Type of pump	Impeller Centrifugal type
	Nozzle Orientation	End Suction- Top Discharge
	Seal Type	Single Mechanical seal (Flushless)
	Duty	Intermittent
	Location	Outdoor
	Minimum liquid level in the tank (in m)	1.2 m
	Normal liquid level in the tank (in m)	12.3 m
	Maximum liquid level in the tank (in m)	12.5 m
	Pump efficiency	Minimum 65%
3.	Material	
	Casing	Ductile iron (65-45-12, ASTM A-536) with replaceable rubber liner/ Hi chrome alloy
	Impeller	Hi Chrome (ASTM 532 Grade IIIA) with minimum hardness of 600-650 BHN or superior material
	Shaft	Duplex Stainless steel (DSS2205, ASTM A-890) or equivalent,
	Shaft sleeve	CD4M Cu ASTM A-743 or equivalent with a minimum hardness of-275 BHN
	Base Plate	Carbon steel epoxy coated
4.	Slurry Analysis	
	Slurry to be handled	Gypsum Slurry
	Maximum solid particle size	200 mesh (70 micron)
	Normal solid particle size, d50	325 mesh (43 micron)
	Chloride concentration	30000 ppm (max)
	Hardness of particle	5-7 (Mho scale)
	Slurry concentration	30 wt%
	Sp. Gravity of slurry	1.2
	Viscosity of Pump	0.01 Pa.S
	pH	4-8
	SiO ₂ Content	4 to 6 g/l



TECHNICAL SPECIFICATION OF SLURRY PUMP NTPC-NORTH KARANPURA (3X660 MW)

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TABLE-A- HORIZONTAL CENTRIFUGAL PUMPS DETAILS		
H.	PRIMARY HYDRO CYCLONE FEED TANK PUMP	
S. No	Description	Requirement
1.	Quantity	
	Quantity for all 3 units	2 no's (1W+1S)
	Total	2 no's
2.	Parameters	
	Pump Design capacity	540 m ³ /hr
	Pump discharge Head	55 m H
	Medium to be handled	Gypsum Slurry
	Temperature	Normal: 63 Deg C Design: 70 Deg C
	Type of pump	Impeller Centrifugal type
	Nozzle Orientation	End Suction- Top Discharge
	Seal Type	Single Mechanical seal (Flushless)
	Duty	Continuous
	Location	Outdoor
	Minimum liquid level in the tank (in m)	1.4 m
	Normal liquid level in the tank (in m)	7.8 m
	Maximum liquid level in the tank (in m)	8.0 m
	Pump efficiency	Minimum 65%
3.	Material	
	Casing	Ductile iron (65-45-12, ASTM A-536) with replaceable rubber liner/ Hi chrome alloy
	Impeller	Hi Chrome (ASTM 532 Grade IIIA) with minimum hardness of 600-650 BHN or superior material
	Shaft	Duplex Stainless steel (DSS2205, ASTM A-890) or equivalent,
	Shaft sleeve	CD4M Cu ASTM A-743 or equivalent with a minimum hardness of-275 BHN
	Base Plate	Carbon steel epoxy coated
4.	Slurry Analysis	
	Slurry to be handled	Gypsum Slurry
	Maximum solid particle size	200 mesh (70 micron)
	Normal solid particle size, d50	325 mesh (43 micron)
	Chloride concentration	30000 ppm (max)
	Hardness of particle	5-7 (Mho scale)
	Slurry concentration	30 wt%
	Sp. Gravity of slurry	1.2
	Viscosity of Pump	0.01 Pa.S
	pH	4-8
	SiO ₂ Content	4 to 6 g/l



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TABLE-B-VERTICAL CENTRIFUGAL PUMP DETAILS

A. ABSORBER AREA DRAIN SUMP PUMP		
	Description	Requirement
1.	Quantity	
	Quantity for Unit -1	2 no's (1W+1S)
	Quantity for Unit -2	2 no's (1W+1S)
	Quantity for Unit -3	2 no's (1W+1S)
	Total	6 no's
2.	Parameters	
	Pump Design capacity	210 m ³ /hr
	Pump discharge Head	30 m H
	Medium to be handled	Gypsum Slurry
	Temperature	Normal: 63 Deg C Design: 70 Deg C
	Type of pump	Impeller Centrifugal type
	Nozzle Orientation	End Suction- Top Discharge
	Duty	Intermittent
	Location	Outdoor
	Minimum liquid level in the tank (in m)	1.4 m
	Normal liquid level in the tank (in m)	3.3 m
	Maximum liquid level in the tank (in m)	3.5 m
	Sump Size	4.0m(L) X 4.0m(W) X 4.0m(D)
	Pump efficiency	Minimum 45%
3.	Material	
	Casing	Ductile iron (65-45-12, ASTM A-536) with replaceable rubber liner/ Hi chrome alloy
	Impeller	Hi Chrome (ASTM 532 Grade IIIA) with minimum hardness of 600-650 BHN or superior material
	Shaft	Duplex Stainless steel (DSS2205, ASTM A-890) or equivalent,
	Shaft sleeve	CD4M Cu ASTM A-743 or equivalent with a minimum hardness of-275 BHN
4.	Slurry Analysis	
	Slurry to be handled	Gypsum Slurry
	Maximum solid particle size	6 to 7 mm.
	Normal solid particle size, d50	325 mesh (43 micron)
	Chloride concentration	30000 ppm (max)
	Hardness of particle	5-7 (Mho scale)
	Slurry concentration	30 wt%
	Sp. Gravity of slurry	1.2
	Viscosity of Pump	0.01 Pa.S
	pH	4-8
	SiO ₂ Content	4 to 6 g/l



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TABLE-B-VERTICAL CENTRIFUGAL PUMP DETAILS

B	GYPSUM AREA DRAIN SUMP PUMP	
	Description	Requirement
1.	Quantity	
	Quantity for all 3 units	2 no's (1W+1S)
	Total	2 no's
2.	Parameters	
	Pump Design capacity	50 m ³ /hr
	Pump discharge Head	25 m H
	Medium to be handled	Gypsum Slurry
	Temperature	Normal: 63 Deg C Design: 70 Deg C
	Type of pump	Impeller Centrifugal type
	Nozzle Orientation	End Suction- Top Discharge
	Duty	Intermittent
	Location	Outdoor
	Minimum liquid level in the tank (in m)	1.4 m
	Normal liquid level in the tank (in m)	3.3 m
	Maximum liquid level in the tank (in m)	3.5 m
	Sump Size	4.0m(L) X 4.0m(W) X 4.0m(D)
	Pump efficiency	Minimum 45%
3.	Material	
	Casing	Ductile iron (65-45-12, ASTM A-536) with replaceable rubber liner/ Hi chrome alloy
	Impeller	Hi Chrome (ASTM 532 Grade IIIA) with minimum hardness of 600-650 BHN or superior material
	Shaft	Duplex Stainless steel (DSS2205, ASTM A-890) or equivalent,
	Shaft sleeve	CD4M Cu ASTM A-743 or equivalent with a minimum hardness of-275 BHN
4.	Slurry Analysis	
	Slurry to be handled	Gypsum Slurry
	Maximum solid particle size	6 to 7 mm.
	Normal solid particle size, d50	325 mesh (43 micron)
	Chloride concentration	30000 ppm (max)
	Hardness of particle	5-7 (Mho scale)
	Slurry concentration	30 wt%
	Sp. Gravity of slurry	1.2
	Viscosity of Pump	0.01 Pa.S
	pH	4-8
	SiO ₂ Content	4 to 6 g/l



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TABLE-B-VERTICAL CENTRIFUGAL PUMP DETAILS		
C	LIMESTONE AREA DRAIN SUMP PUMP	
S. No	Description	Requirement
1.	Quantity	
	Quantity for all 3 units	2 no's (1W+1S)
	Total	2 no's
2.	Parameters	
	Pump Design capacity	50 m ³ /hr
	Pump discharge Head	25 m H
	Medium to be handled	Limestone Slurry
	Temperature	Normal: 45 Deg C Design: 50 Deg C
	Type of pump	Impeller Centrifugal type
	Nozzle Orientation	End Suction- Top Discharge
	Duty	Intermittent
	Location	Outdoor
	Minimum liquid level in the tank (in m)	1.4 m
	Normal liquid level in the tank (in m)	3.3 m
	Maximum liquid level in the tank (in m)	3.5 m
	Sump Size	4.0m(L) X 4.0m(W) X 4.0m(D)
	Pump efficiency	Minimum 45%
3.	Material	
	Casing	Ductile iron (65-45-12, ASTM A-536) with replaceable rubber liner/ Hi chrome alloy
	Impeller	Hi Chrome (ASTM 532 Grade IIIA) with minimum hardness of 600-650 BHN or superior material
	Shaft	Duplex Stainless steel (DSS2205, ASTM A-890) or equivalent,
	Shaft sleeve	CD4M Cu ASTM A-743 or equivalent with a minimum hardness of-275 BHN
4.	Slurry Analysis	
	Slurry to be handled	Limestone Slurry
	Maximum solid particle size	6 to 7 mm.
	Normal solid particle size, d50	325 mesh (43 micron)
	Chloride concentration	100 ppm (max)
	Hardness of particle	5-7 (Mho scale)
	Slurry concentration	30 wt%
	Sp. Gravity of slurry	1.2
	Viscosity of Pump	0.03 Pa.S
	pH	4-8
	SiO ₂ Content	4 to 6 g/l



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5.2 POWER SUPPLY DETAILS:

4.	POWER SUPPLY	
	The following voltage levels shall apply:	
	3 phase, 3.3 kV AC ,50 Hz	Voltage for motors equal to / bigger than 200KW and for power distribution within the plant.
	3 phase, 415 V, AC , 50 Hz	Standard voltage for power supplies to electric power consumers and motors Above 0.2 KW and upto 200 kW.
	240V AC / 3 phase 415 V AC, 50 Hz	Standard voltage for power supplies to electric power consumers and motors Upto 0.2 kW.
	1. All equipments shall be suitable for rated frequency of 50 Hz with a variation of + 3% & -5%, and 10 % combined variation of voltage and frequency unless specifically brought out in the specification. 2. Bidder shall design and supply the equipment suitable for satisfactory operation under above mentioned power supply condition.	

5.3 FLUSHING WATER ANALYSIS

Process water shall be used for flushing of the Slurry pump. Process water analysis is given below.

S.No	Constituents	Unit	Water quality
1.	Total Dissolved Solids	ppm	~330
2.	Calcium as CaCO ₃	ppm	65
3.	Magnesium as CaCO ₃	ppm	41
4.	Sodium as CaCO ₃	ppm	103
5.	Potassium as CaCO ₃	ppm	
6.	Iron as Fe	ppm	1.2
7.	Fluoride as F	ppm	0.11
8.	Bicarbonate as CaCO ₃	ppm	150
9.	Chlorides as CaCO ₃	ppm	25
10.	Sulphate as CaCO ₃	ppm	34
11.	Nitrate as NO ₃	ppm	0.55
12.	Silica as SiO ₂	ppm	9
13.	pH		7.6 – 8.2
14.	Turbidity	NTU	200



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6.0 SCOPE OF SUPPLY

Scope for the bidders shall include Design, Supply and Supervision of Erection & Commissioning.

Design: Includes basic engineering, detail engineering, preparation and submission of engineering drawings/calculations/datasheets/quality assurance documents/field quality plans, storage instructions, commissioning procedures, operation & maintenance manuals, performance guarantee test procedures and assisting BHEL in obtaining time bound approval from NTPC.

Supply: Includes manufacturing/fabrication, shop floor testing, stage inspections, final inspections, painting & packing.

Supervision of Erection & commissioning: Includes supervision of erection & commissioning, supervision of trial operation, training of customer's O&M Personnel and handing over to End customer.

The scope of supply for Slurry pump shall include but not limited to the following:

Sl. No	Scope
1.	Slurry pump complete with
	i. Casing
	ii. Rotor and Shaft assembly
	iii. Drive motor (Premium Efficiency class IE3 type) as per specification
	iv. Coupling
	v. Common base frame and shock pads
	vi. Single Mechanical seal with automatic flushing with a connection for additional manual flushing wherever applicable.
	vii. Flushing and drain system
	viii. Coupling guards with bolts
	ix. Expansion joints at suction and Discharge
	x. Companion flanges with gaskets and fasteners
	xi. Casing drain terminated at battery limit with flange
	xii. Cooling water piping for Bearing cooling
	xiii. Lubrication system
	xiv. Foundation bolts for supplied items
	xv. Pedestal
	xvi. Drip tray
	xvii. Lantern Ring
	xviii. Mechanical Running and Performance test at shop
	xix. Painting and Rust Prevention during shipment and construction
	xx. Supervision of Erection & commissioning at site
	xxi. Special tools & tackles as applicable
	xxii. Accessory Piping within the skid
	xxiii. Start-up & Commissioning spares as applicable (Supply of temporary strainers as part of start-up spares is mandatory).



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Sl. No	Scope
xxiv.	Seaworthy Packing & Forwarding (for import supplies) to Project Site office
xxv.	Installation, operation and maintenance manuals
xxvi.	Any other items required for completeness of the equipment except the items covered in the exclusions.

6.1	TECHNICAL REQUIREMENTS	Vendor to Confirm
1.	All slurry pumps for a particular service shall be identical and interchangeable.	
2.	All the slurry pumps shall be provided with motorized suction and discharge valves. In addition, flushing water lines with motorized valves shall be provided for each pump for automatic flushing of the pump after each shut down. The flushing water for the pumps shall be taken from the process water supply.	
3.	In case of pump with rubber lined casing, the casing should be radially split to allow easy removal of impeller.	
4.	All the pump wear parts in contact with the slurry shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. The Bidder can also offer a hi chrome alloy lined pump if the Bidder has previous experience of the same for similar applications. The material used by the contractor shall be proven in previous installations.	
5.	The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement. All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hrs.	
6.	The design of the shaft shall ensure that the operating speed is at least 20% above the critical speed of the shaft.	
7.	The pump shall be provided with seals of proven type and shall be designed for minimization of seal water consumption. The shaft shall be supported on heavy duty ball/roller bearings.	
8.	The Pump shall be capable of developing the required total head at rated capacity for continuous operation. Also the pumps shall be capable of being operated to give satisfactory performance at any point on the HQ characteristics curve. The operating range of the pump shall be 40% to 120% of the duty point unless otherwise mentioned elsewhere. The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the rated design flow as indicated.	
9.	The total head capacity curve shall be continuously rising from the operating point towards shut-off without any zone of instability and with a minimum shut-off head of about 15% more than the design head.	
10.	Pumps of a particular category shall be identical and shall be suitable for parallel operation with equal load division. The head Vs capacity and BHP Vs capacity characteristics should match to ensure even load sharing and trouble free operation throughout the range. Components of identical pumps shall be interchangeable.	



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11.	Pumps shall run smoothly without undue noise and vibration. Peak to peak vibration limits shall be restricted to the following values during operation: <table><tr><td>Speed</td><td>Antifriction Bearing</td><td>Sleeve Bearing</td></tr><tr><td>1500 rpm and below</td><td>75.0 micron</td><td>75.0 micron</td></tr><tr><td>3000 rpm</td><td>50.0 micron</td><td>65.0 micron</td></tr></table>	Speed	Antifriction Bearing	Sleeve Bearing	1500 rpm and below	75.0 micron	75.0 micron	3000 rpm	50.0 micron	65.0 micron	
Speed	Antifriction Bearing	Sleeve Bearing									
1500 rpm and below	75.0 micron	75.0 micron									
3000 rpm	50.0 micron	65.0 micron									
12.	The pumps shall be capable of starting with discharge valve fully open and close condition. Motors shall be selected to suit to the above requirements. Minimum motor margin (as per table below) shall be provided above maximum load demand of the pump in the entire operating range to take care of the system frequency variation and no case less than the maximum power requirement at any condition of the entire characteristic curve of the pump. Continuous Motor rating shall be at 50 deg.C ambient. Motor margin shall be as below <table><tr><td>Pump rated BKW</td><td>Motor rating</td></tr><tr><td><22 kW</td><td>125% of pump rated BKW</td></tr><tr><td>22 kW – 55 kW</td><td>115% of pump rated BKW</td></tr><tr><td>>55 kW</td><td>110% of pump rated BKW</td></tr></table>	Pump rated BKW	Motor rating	<22 kW	125% of pump rated BKW	22 kW – 55 kW	115% of pump rated BKW	>55 kW	110% of pump rated BKW		
Pump rated BKW	Motor rating										
<22 kW	125% of pump rated BKW										
22 kW – 55 kW	115% of pump rated BKW										
>55 kW	110% of pump rated BKW										
13.	The kW rating of the drive unit shall be based on continuously driving the connected equipment for the conditions specified. However, in cases where parallel operation of the pumps are specified, the actual motor rating is to be selected by the Bidder considering overloading of the pumps in the event of tripping of operating pump(s).										
14.	Pumps shall be so designed that pump impellers and other accessories of the pumps are not damaged due to flow reversal.										
15.	The Contractor under this specification shall assume full responsibility in the operation of pump and motor as a unit.										
16.	The pumps shall be designed as impeller centrifugal (non-clog centrifugal) pump. The pumps shall be wear-resistant, be equipped with flushing devices to prevent sedimentation and shall be designed and installed in a manner to allow easy replacements, repair and maintenance.										
17.	Single mechanical seals with automatic flushing with a connection for additional manual flushing shall be applied.										
18.	Pumps shall have the rated capacity near the best efficiency point										
19.	Impellers shall be single piece casting. Fabricated impellers shall not be accepted.										
20.	The Pumps shall be wear resistant be equipped with flushing devices to prevent sedimentation and shall be designed and installed in a manner to allow easy replacements, repair and maintenance.										
21.	The slurry pumps shall be equipped with oil level indication, coupling guard and collecting equipment for leakage, made of resistant material.										
22.	Single mechanical seals with automatic flushing with a connection for additional manual flushing shall be applied.										
23.	Pump shall be either belt drive or Gear Box type. If the belt drive is chosen by the vendor, vendor should adhere to the applicable standards for ensuring the										



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	performance of the pumps as per the specification. A service factor of 1.5 or better should be considered for Gear Box.	
24.	All pumps shall be designed to withstand a test pressure of 200% of pump rated head or 1.5 times the maximum possible pump shut off pressure under maximum suction pressure conditions.	
25.	Product water flushing lines and drains are to be supplied for each pump handling the prevailing water to avoid corrosion if the pump is out of operation for extended periods.	
26.	Pumps must be carefully set to ensure that the net positive suction head available under all operating conditions will be adequate. The NPSH Values are to be referred to the least favorable operating conditions- lowest atmospheric pressure, lowest level of water on the suction side of the pump and highest temperature of the pumped fluid. An adequate safety margin of normally greater than 1m to the max NPSH required shall be provided.	
27.	The Pump flow/head characteristics shall be such that within the operation range the head will continuously increase with decreasing flow, maximum head (shut off head) being at least 10% higher than the duty point head.	
28.	All pumps shall be fitted with suction and discharge pressure gauges	
29.	Venting valve shall be fitted to all pumps at suitable points on the pump casing unless the pump is self-venting due to the arrangement of the suction and discharge nozzles. Drainage facilities shall be provided on the pump casing or adjacent pipe work to facilitate the dismantling of pumps.	
30.	Pumps shall have stable head-capacity characteristics curve from run-off to shut-off. Shut-off head should be minimum 125% of Best Efficiency Point (BEP).	
31.	Selection of Duty point should preferably be at BEP (Best Efficiency Point) or slightly at the left of BEP. Selection point beyond 115% of BEP will not be acceptable. It should be noted that head variation is due to level variation in tank. Pump has to run in the system without compromising it's NPSH requirement at lowest water level in tank. Hence, when tanks are filled-up and is at normal water level, pump will operate at the right of BEP, pump's operating zone should be considered accordingly.	
32.	External flushing is required to remove the accumulated particles and all related information should be mentioned in data sheet.	
33.	Pump should have adjustment provision of axial clearance between casing and impeller for maintenance of performance at best efficiency when there is wear in between impeller and casing.	
34.	In case rubber or nonmetallic linings are used, these will be two piece molded under pressure and adjusted to the screwed metallic clamping which have been welded to the casting.	
35.	Each pump will have a coupling of adequate size, designed for full load and capable of supporting start –Up an overload moment. Each half of the coupling will be factory mounted and locked to its shaft. The coupling must be able to accept the adjustment of the impeller.	



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36.	The Antifriction bearing of the pumps shall be designed for minimum useful life (L-10) of 20,000 hours of continuous operation (Under the design condition). The thrust bearing will have dimensions for a minimum of 175 % of the required load.	
37.	The pumps shall have mechanical seals of cartridge type with self-lubrication sliding ring cartridges. The static part will be mounted on the seal plate with circumferential ring (O-ring) or another flexible sealing ring. Built in seal design will not be accepted.	
38.	The sealing areas shall be designed in such a way so that solids do not precipitate in them affect the cooling or affect the adjustment and mechanical functioning of the seals. Seals which do not need jet cleaning are preferred.	
39.	Pump induced vibration due to flow pulsations shall be avoided through suitable design.	
40.	Each rotating equipment shall be first statically balanced and then dynamically balanced according to ISO 1940 (in the case of impellers this shall be done before and after mounting of the service rotor shaft).	
6.2	CONSTRUCTIONAL FEATURES	Vendor to Confirm
A)	CASING	
a.	Pumps shall be of Radial Split Casing, Close/Semi-open, Over-hang, End Suction Type Back Pull-out design, Vertical Discharge type for Horizontal Centrifugal Pump.	
b.	The casing shall be designed to withstand the maximum shut-off pressure developed by the pump at the pumping temperature.	
c.	Pump casing shall be provided with a vent connection and piping with fittings & valves. Casing drain as required shall be provided complete with drain valves, piping and plugs.	
d.	Pump casing be provided with a connection for suction and discharge pressure gauge as standard feature. It shall be structurally sound to provide housing for the pump assembly and shall be designed hydraulically to minimum radial load at part load operation.	
e.	Lifting provision of pump as a whole and individual casing half should be provided.	
f.	For replaceable rubber liner, hardness of rubber should be of Shore hardness- SA 65 (+/-) 5. Rubber should be of Type and Class as defined by ASTM D-2000 which is suitable for uninterrupted operation of 5 years (minimum).	
g.	Renewable wear rings shall be provided at points of running clearance and shall be made from appropriate materials.	
B)	IMPELLER	Vendor to Confirm



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a.	Impeller shall be closed, semi-closed or open type and designed in conformance with the detailed analysis of the liquid being handled. The impeller shall be secured to the shaft, and shall be retained against circumferential movement by keying, pinning or lock rings. On pumps with overhung shaft, impellers shall be secured to the shaft by a lockout or cap screw which tightness in the direction of normal rotation.	
b.	For rubber lined pumps, tip speed of impeller shall not exceed 25 m/sec and for other pumps not over 30 m/sec.	
c.	Miller number for the material should be justified for that pumping medium as per ASTM G75-95 as well as the corrosion effect of pumping medium	
d.	Base material for rubber-lined impeller should be capable of handling speed as specified in the respective clause without affecting adhesion of lining. Impeller as rotating assembly along with all elements should be dynamically balanced according to ISO 1940	
e.	Maximum size impellers for the pump body shall not be quoted for. By installation of a new impeller a head increase of 5% minimum shall be possible.	
C)	IMPELLER/CASING WEARING RINGS	Vendor to Confirm
a.	Replaceable type wearing rings shall be provided at suitable locations of pumps. Suitable method of locking the wearing ring shall be used. Wearing rings shall be provided in pump casing and/or impeller as per manufacturer's standard practice.	
D)	SHAFT	Vendor to Confirm
b.	The critical speed shall be well away from the operating speed and in no case less than 130% of the rated speed. The shaft shall be ground and polished to final dimensions and shall be adequately sized to withstand all stresses from rotor weight, hydraulic loads, vibration and torques coming in during operation.	
c.	All Pump shafts shall be of ample size to transmit the maximum possible output from the prime mover.	
d.	The pump shaft and coupling are to be so dimensioned that the maximum permissible torque of the shaft is higher than the maximum transmissible torque of the coupling and gear.	
e.	Pumps shall operate smoothly throughout the speed range up to their operating speeds. The first coupled critical speed must be at least 20% higher than the maximum operating speed. The determination of the shaft diameter and the distance between two consecutive bearings must include a sufficiently large safety margin to satisfy this condition.	
f.	Shafts shall be conservatively designed to transmit maximum power required and to assure rigidity. Shafts shall be machined and ground to close tolerances and shall be tapered to permit easy removal of the seals and bearings.	
g.	Shaft shall run in high precision heavy duty roller bearings. Lubrication system	



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	provided shall be such that visual checking of lubricant level is possible	
h.	The shaft shall be finished to close tolerance at the rotor, coupling and bearing diameters. The size of shaft shall be calculated on the basis of maximum combined shear stress. This shear stress shall not exceed 30 percent of the elastic limit in tension or 18 percent of ultimate tensile strength.	
i.	No parts of the shaft should come in contact with the liquid medium for horizontal centrifugal pump.	
j.	Shaft should have a keyed joint at impeller hub. No thread connection between impeller and shaft is acceptable.	
E)	SHAFT SLEEVES	
a.	Renewable type fine finished shaft sleeves shall be provided at mechanical seals. Shaft sleeves shall be fastened to the shaft to prevent any leakage or loosening. Shaft and shaft sleeve assembly should ensure concentric rotation.	
F)	BEARINGS	
a.	Heavy duty bearings, adequately designed for the type of service specified in the enclosed pump data sheet and for long, trouble free operation shall be furnished. The bearings offered shall be capable of taking both the radial and axial thrust coming into play during operation. In case, sleeve bearings are offered additional thrust bearings shall be provided. Antifriction bearings of standard type, if provided, shall be selected for a minimum life 20,000 hrs. of continuous operation at maximum axial and radial loads and rated speed. Proper lubricating arrangement for the bearings shall be provided. The design shall be such that the bearing lubricating element does not contaminate the liquid pumped. Where there is a possibility of liquid entering the bearings suitable arrangement in the form of deflectors or any other suitable arrangement must be provided ahead of bearings assembly. Bearings shall be easily accessible without disturbing the pump assembly. A drain plug shall be provided at the bottom of each bearings housing.	
b.	The bearings may be ball, roller or sleeve bearing. If sleeve bearings are used these shall be machined for close running fit. The bearings shall be designed to take the necessary radial load as well as the net axial thrust. Bearings shall be lubricated properly and sized for an operating life of 20,000 hours on the basis of maximum load. Oil level indication shall be provided.	
c.	The bearings shall be of automatic oil lubricated type. Vibration sensors and temperature measurements incl. temperature transmitter for continuous monitoring shall be provided.	
d.	Bearing housings on horizontal shaft pumps shall be designed to enable the bearings to be replaced without removing the pump or motor from its mounting. Bearing housings on horizontal shaft pumps shall be effectively protected against the ingress of water, pumped fluid and dust by suitable nonferrous deflectors.	



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e.	If bearing housing requires cooling water, volume and pressure of cooling water is to be indicated in Technical Data Sheet.	
f.	Lubricating oil will be the responsibility of pump manufacturer. Hence, manufacturer has to make arrangement of first fill of oil at installation, and at commissioning stage. Quantity of oil and its grade is to be indicated in Drawing and Operation Manual.	
G)	MECHANICAL SEALS	
a.	Mechanical seals shall be of single type with either sliding gasket or bellows between the axially moving face and shaft sleeves or any other suitable type. The sealing faces should be highly lapped surfaces of materials known for their low frictional coefficient and resistance to corrosion against the liquid being pumped.	
b.	The pump supplier shall coordinate with the seal maker in establishing the seal chamber of circulation rate for maintaining a stable film at the seal face. The seal piping system shall form an integral part of the pump assembly. For the seals under vacuum service, the seal design must ensure sealing against atmospheric pressure even when the pumps are not operating. Necessary provision for seal water supply along with complete piping fittings and valves as required shall form integral part of pump supply.	
c.	The Mechanical Seals shall be so arranged that repacking or fitting of replacement seals can be carried out with the minimum of disruption to plant operation.	
d.	Design the mechanical seals chamber to have sufficient room to lubricate and get seal face cool with its own slurry.	
e.	Provide requirements for periodical flushing to rinse the seal face for leaked slurry.	
f.	Pump shall be supplied with mechanical seal. All mechanical seals, regardless of type or arrangement, shall be of the cartridge design. Hook sleeve cartridge should not be used.	
g.	Requirement of flushing water, its quantity, and pressure to be indicated in data sheet.	
h.	Zero leakage is the intension of this specification. However, quantity of leakage, if it is unavoidable, pump should have a provision of collecting of any drip leakage and flushing the same to nearby pit is to be providing without corroding the base plate of pump.	
i.	Mechanical seals shall be fitted and installed in the pump before shipment and shall be clean. Mechanical seals shall be plugged with screw for shipping	
j.	Intention of the specification is not to specify Type of Seal, Seal design, Spring configuration, Seal configuration, Balanced or Unbalance type etc. Pump manufacturer to decide the same along with seal manufacturer the best seal that is suitable for the offered pump.	
k.	Seal life has to be guaranteed, taking into consideration all its components for 25000 hrs. If the seals fail before the completion of guaranteed period, the same should be replaced free of cost by the bidder.	



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H)	COUPLING	Vendor to Confirm
a.	The pump and motor shafts shall be connected with an adequately sized flexible coupling of proven design with a spacer to facilitate dismantling of the pump without disturbing the motor. Necessary coupling guards shall also be provided.	
b.	Coupling halves shall be machine matched to ensure accurate alignment. Couplings and gears must have a rated capacity of at least 120% of the maximum potential power transmission requirement.	
c.	Coupling shall be of flexible type made of cast steel. The Bidder shall furnish both halves of the coupling. Both the Coupling halves shall be bored and keyed to fit shafts of the gearbox and the motor by bidder.	
d.	All rotating parts such as coupling shall be covered with suitable protective guards. Guards shall be easily removable type. If weight of the coupling is heavy (>40 kgs), provision of tapped hole should be incorporated in right place of hub to handle the same effortlessly	
I)	BASE PLATE	Vendor to Confirm
a.	A common base plate mounting both for the pump and motor shall be furnished. The base plate shall be fabricated steel and of rigid construction, suitably ribbed and reinforced. Base plate and pump supports shall be so constructed and the piping unit so mounted as to minimize misalignment caused by mechanical forces such as normal piping strain, internal differential thermal expansion and hydraulic piping thrust. Suitable drain troughs and drip lip shall be provided.	
b.	Suitable holes shall be provided for grouting and these shall be so located that the base plate can be grouted in place without disturbing the pump and motor.	
c.	Base plate must have provision of aligning driver and driven shaft in both directions of base plate so that shafts can be aligned. Similarly, provision must be provided for alignment of shaft in vertical plane.	
d.	Pump manufacturer is to supply base plate along with Foundation bolt & Nut, "Taper wedge" and the necessary fastener for Pump and Motor with Base plate.	
e.	Base plate must be provided with a trough, material of which must be compatible of pumping liquid. Leaked liquid, collected in trough, can be systematically routed at designated point	
f.	Base plate must be stress-relieved for any residual welding stress and certificate to that effect is to be submitted as per inspection requirement.	
J)	ASSEMBLY AND DISMANTLING	Vendor to Confirm
i.	Assembly and dismantling of each pump with drive motor shall be possible	



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	without disturbing the grouting base plate or alignment.	
K)	ADDITIONAL REQUIREMENT FOR VERTICAL SUMP PUMP	Vendor to Confirm
	The pumps shall be designed for continuous operation. The pump shall be single stage centrifugal type with semi open or open impeller. The pump impeller shall be cantilever type and shall not be supported below the base plate for easy withdrawal.	
	The pump shall deliver the rated flow at rated head with margins as specified in the respective clauses. The pump shall be capable of pumping of slurry with solid concentration upto 30 wt% & particle lumps of 6-7mm.	
	The material chosen for the pump components shall be suitable for the fluid handled and shall be proven in similar application.	
	The pumps shall not be supported below the base plate level for easy withdrawal without entering the sump.	
M)	ACCESSORIES:	Vendor to Confirm
1.	Expansion Joints:	
i.	Expansion bellows with limiting bolt and nut shall be provided at suction and discharge of each pump	
2.	Pump control:	
i.	Each pump shall be furnished with required instrumentation and electrical accessory devices mounted and connected in a control cabinet.	
ii.	Provisions shall be made for the interface between the local cabinet and the DCS such that the operation of the pumps can be controlled from the control console in the FGD Control room	

6.3

Motor

6.3.1 General

This specification generally covers the requirement for motors involved in Slurry Pumps system package.



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6.3.2 Voltage level:

The voltage level for motors shall be as follows:

S.No	Rating	Voltage	Freq and voltage variation
1	Upto 0.2 kw	Single phase 240V AC / Three phase 415V AC	1. 50 Hz- +3% & -5 % 2. 10% combined variation of voltage & frequency.
2	Above 0.2 and up to 200 kw	Three phase 415V AC	

6.3.3 Starting voltage requirement

Up to 85% of rated voltage for ratings below 110 KW

Up to 80% of rated voltage for ratings from 110 KW to 200 KW

- Voltage rating for special purpose motors viz, VFD shall be as per manufacturer's standard.

6.3.4 Degree of protection:

S.NO	Item	Indoor	Outdoor
1	Motors	IP 54	IP 55
2	Cable box	IP 54	IP 55

6.3.5 Efficiency class:

Premium efficiency IE3 (For Continuous duty motors up to 200 kw) as per IS 12615,IEC:60034-30

6.3.6 General requirements:

S.No	Parameters	To be confirmed by vendor	Vendor to Confirm
1	Direction of rotation	Suitable for both directions	
2	Class of Insulation	Thermal class 155 (F) insulation	
3	Winding Insulation	The winding insulation process shall be Global Vacuum Pressure Impregnated i.e. resin poor method	
4	Starting Current	1. Less than or equal to 600 % full load current subject to tolerance as per IS (Normal motor) 2. Less than or equal to 700 % full load current	



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		subject to tolerance as per IS (Normal motor)		
5	Starting Voltage	1. Up to 85% of rated voltage for ratings below 110 KW 2. Up to 80% of rated voltage for ratings from 110 KW to 200 KW		
6	Torque requirement	1. Accelerating torque at any speed with the lowest permissible starting voltage shall be at least 10% motor full load torque. 2. Pull out torque at rated voltage shall not be less than 205% of full load torque. It shall be 275% for crane duty motors.		
7	Type of enclosure	1. Motors shall be either Totally enclosed fan cooled (TEFC) or totally enclosed tube ventilated (TETV) or Closed air circuit air cooled (CACA) type. 2. VFD driven motors to be offered with forced cooling type with machine mounted fan or pump driven by separate electric motor.		
8	Dimensions of Terminal box for LV motors	Motor MCR	Distance between center of stud & gland plate (in mm)	
		a. Upto 3 Kw b. Above 3 kw to 7 kw c. Above 7 kw to 13 kw d. Above 13 kw to 24kw e. Above 24 kw to 37kw f. Above 37 kw to 55kw g. Above 55 kw to 90kw	As per manufacturer's practice 85 115 167 196 249 277	
9	Cable glands & Lugs	Double compression type Nickel plated brass cable gland & insulated tinned copper crimping lugs to suit the cable sizes		
10	Paint shade	RAL 5012 (Blue)		
11	Space heaters	Suitable single phase space heaters shall be provided on motors rated 30KW and above. Separate terminal box for space heaters shall be provided		



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6.3.7 Locked rotor withstand time

	Starting time at min permissible voltage	Locked rotor withstand time
1	Upto 20 secs	Under hot condition at highest voltage limit shall be at least 2.5 secs. more than starting time
2	More than 20 sec & less than 45 sec	Under hot condition at highest voltage limit shall be at least 5 secs. more than starting time
3	More than 45 sec's	under hot condition at highest voltage limit shall be more than starting time by at least 10% of the starting time

6.3.8 Special Requirement:

Motor operating through variable frequency drives shall be suitable for inverter duty. Also these motors shall comply the requirements stipulated in IEC: 60034-18-41 and IEC: 60034-18-42 as applicable.

6.3.9 Torque Requirements

- Accelerating torque at any speed with the lowest permissible starting voltage shall be at least 10% motor full load torque.
- Pull out torque at rated voltage shall not be less than 205% of full load torque. It shall be 275% for crane duty motors.

6.4 INSTRUMENTS

6.4.1 General:

This section covers the specification for instruments involved in slurry pumps.

Instruments as per attached list (Section 6.4.3) shall be minimum. Instruments that are required for satisfactory operation of the system though not indicated in the list shall also be supplied.

6.4.2 INSTRUMENTS:

6.4.2.1 General:

All transmitters, sensors, switches and gauges for parameters like pressure, level, flow etc. as required for the safe and efficient operation and maintenance of equipment in the system under the scope of specification shall be provided on as required basis.



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6.4.2.2

The contacts of equipment mounted instruments, sensors, switches etc. for external connection including spare contacts shall be wired out in flexible/rigid conduits, independently to suitably located common junction boxes. The necessary cables, flexible conduits, junction boxes and accessories for the above purpose shall also be supplied. Double root valves shall be provided for all pressure tapping where the pressure exceeds 40 Kg./sq.cm.

7.0 GENERAL REQUIREMENTS:

S. No.	Description	Vendor to confirm
1.	Metric unit shall be used in the drawings and in the any displays on the equipments. Special attention should be taken that the unit of pressure shall be in dual scales of kPa and kg/cm ² G. For instance the pressure gauges should have dual unit's indication.	
2.	Descriptions in the drawings, in the documents, and in the displays shall be in English	
3.	All rotating parts such as coupling shall be covered with suitable protective guards. Guards shall be easily removable type.	
4.	The equipment shall be designed to withstand the corrosive and moist environment in which these are proposed to operate.	
5.	Noise level produced by any rotating equipment individually or collectively shall not exceed 85 dB measured at a distance of 1.0 meter horizontally from the source in any direction and 1.5m above operating floor. Predicted sound pressure levels for the pump drive assemblies shall be submitted as part of the proposal data.	
6.	The overall vibration level shall be as per ISO 10816.	
7.	Suitable drain connections shall be provided.	
8.	The equipment shall be suitable for stable operation continuously.	
9.	Limit of connection: The buyer (BHEL) has an intention to minimize interface for utilities as much as possible. The bidder shall consider this requirement in the planning stage of layout for the equipment. The bidder shall provide the header piping for utilities and branch piping to each nozzle. Terminal points for all utilities shall be located at skid edge. The bidder shall specify all terminal points with tie-in number in the P&ID and submit it in the proposal to confirm the scope of supply.	
10.	Service life: Entire equipment except wearing parts shall be designed and fabricated for a minimum service life of 30 years of operation or 200,000 full load	



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S. No.	Description	Vendor to confirm
	operating hours whichever is longer.	
11.	Corrosion allowance: Corrosion allowance for entire equipment shall be in accordance with latest applicable Indian / International standard.	
12.	Unless otherwise specified , flanges shall be in accordance with ANSI B16.5 Class 150	
13.	Name plate: All equipment shall be provided with nameplates indicating the item number and service name. Name plates shall be of 304 Stainless steel plate and placed at a readily visible location. Nameplate of main equipment shall have enough information, which will be confirmed during engineering phase. Stainless steel nameplates for all instruments and valves shall be provided.	
14.	Rotation arrows shall be cast in or attached with stainless steel plate on each item of rotation equipment at a readily visible location.	
15.	Unless otherwise specified, all equipment items where the weight exceeds 15 kg shall be provided with suitable lifting lugs, ears or ring bolts or tapped holes for lifting rings. Minimum shock factor for lifting lugs shall be minimum 2.0. The position of lifting lugs and reference dimension shall be shown on GA and/or outline drawings. NDT shall be conducted for lifting lugs. When any spreader bars are required for lifting and laydown, the bidder shall provide spreader bar with equipment.	
16.	Skid Mount/Transportation: Equipment shall be fabricated as skid mount design as much as practical to minimize erection at the site.	
17.	Two pieces of stainless steel earth lugs shall be provided with equipment diagonally. The position of earth lugs shall be shown on each GA and/or outline drawing.	
18.	Provide double nuts for anchor bolts	
19.	Bidder shall provide allowable vibration level on foundation in foundation drawings and/or general arrangement drawings.	
20.	If the driver/driven equipment train is in the resonance condition or any vibration problems occur, the bidder shall solve the problems in a timely manner.	
21.	Bidder shall provide the mating flanges with the necessary gaskets.	
22.	All the surfaces of the carbon steel should be rust prevented before shipment for the period of at least 12 months for storage and construction.	
23.	Bidder to provide capacity of crane or hoist required for material handling and the details of heaviest component to be handled.	
24.	The list of all Bought out items with makes and country of origin to be mentioned along with offer to be submitted.	
25.	Quality Plan to be submitted along with the offer.	



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S. No.	Description	Vendor to confirm
26.	Cost towards the participation in discussions/meetings, providing technical assistance during technical discussions/meetings with customer for approval of drawing/documents etc. TA/DA, boarding and lodging to attend these meetings shall be borne by the bidder and shall be inclusive in supply portion.	
27.	Material of construction for all equipment/components shall be subject to NTPC/ BHEL approval during detail engineering. Accordingly bidder shall consider MOC for all equipment/component as per best engineering practice, global standard and global references.	
28.	Bidder to provide sub vendor list and Bidder shall strictly adhere to NTPC approved vendor list. In case bidder proposes an additional vendor for an item or vendor approval is required for any new item, acceptance shall be subject to approval by NTPC/ BHEL before placing order and bidder shall submit relevant documents as per Annexure-XI-Sub-Vendor Questionnaire .	
29.	It shall be the complete responsibility of the successful bidders to obtain "Sub Vendor Approval" from BHEL / NTPC for all equipments & components. Any delay in sub vendor's approval should not affect the project schedule. If any of the sub vendors does not have the approval of NTPC/ BHEL, the same may be replaced with another NTPC/BHEL approved sub-vendor only, without any price implications to BHEL.	
30.	The modalities of inspection (Stage, Final, In-process) shall be finalized during detail engineering after submission of quality assurance plan (QAP). It shall be reviewed by the NTPC/ BHEL. Bidder shall follow the procedures of inspection as per the approved QAP. Bidder has to submit the following documents along with inspection call and if any other documents required as per approved QAP. - Raw material inspection certificate - Internal test reports - Statutory certificates as required. - All inspection & testing shall be carried out based on the following documents: b. Relevant Standards c. Specifications d. Approved drawings e. Data Sheets f. Calibration certificate for all the measuring instruments g. Bidder should also coordinate in getting the MDCC's (Material Dispatch clearance certificate) and all types of IC's (Inspection Certificates) from the NTPC along with BHEL.	
31.	Minor Chipping i.e. up to 50 mm thk, micro leveling and providing shim plates for erection of equipment / item at site shall be in the scope of bidder.	



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S. No.	Description	Vendor to confirm
32.	During detail engineering, bidder to strictly adhere to BHEL/NTPC drawing formats, document numbering, quality plan & FQP formats	
33.	The identification and numbering of equipment, systems, items, etc. of supply, as well as of all documents and drawings shall be in accordance with reference Designation System for Power Plants - KKS system.	
34.	Complete detail engineering drawings, calculations, selection of components etc. shall be reviewed & subject to approval of BHEL/NTPC during detail engineering	
35.	Bidder shall furnish necessary inputs & drawings of all equipment in editable Auto CAD/ MS-Word /Excel format.	
36.	During detail engineering, successful bidder shall ensure flow of drawings/documents as per schedule. Any comments from BHEL/NTPC should be addressed timely by the bidder.	
37.	Bidder to note that list above is not exhaustive and any work /items required for completing the smooth operation and ensuring satisfactory running of the machines till final hand over to the end user shall also be in the scope of the bidder.	
38.	Bidder shall submit the signed and stamped copy of all the pages which constitutes this technical enquiry specification signed by authorized signatory and clearly mentioning each clause under following two categories to avoid any ambiguity in scope understanding & the scope division along with technical offer. a. "Accepted without deviation and considered in scope of work" b. "Not considered in scope of work"	
8.0	PACKING AND FORWARDING	Vendor to confirm
1.	Proper packing to be ensured. Indigenous Supply: Pump & sub system assembly shall be wrapped in polythene bags & packed in a strong rigid wooden crate. Rain water should not enter into the pump internals during storage in the outer yard of power plant. Imported Supply: All imported supply should be packed as per Sea worthy packing standards Annexure - VIII. All imported items should have Sea worthy packing. Liberal packing materials and struts shall be provided to arrest rolling and to protect from transit damages.	
2.	Equipment and process materials shall be packed and semi-knocked down, to the extent possible, to facilitate handling and storage and to protect bearings and other machine surfaces from oxidation. Each container, box, crate or bundle shall be reinforced with steel strapping in such a manner that breaking of one strap will not cause complete failure of packaging. The packing shall be of best standard to withstand rough handling and to provide suitable protection from tropical weather while in transit and while awaiting erection at the site.	



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S. No.	Description	Vendor to confirm
3.	Equipment and materials in wooden cases or crates shall be properly cushioned to withstand the abuse of handling, transportation and storage. Packing shall include preservatives suitable to tropical conditions. All machine surfaces and bearings shall be coated with oxidation preventive compounds. All parts subject to damage when in contact with water shall be coated with suitable grease and wrapped in heavy asphalt or tar impregnated paper.	
4.	Crates and packing material used for shipping will become the property of owner.(NTPC)	
5.	Packaging or shipping units shall be designed within the limitations of the unloading facilities of the receiving ports and the ship will be used. It shall be the bidder's responsibility to investigate these limitations and to provide suitable packaging and shipping to permit transportation to site.	
6.	Packing (tare) shall be part of the equipment cost and shall not be subject to return. The packing should ensure integrity and cohesiveness of each delivery batch of equipment during transportation. In case of equipment assemblies and unit's delivery in the packing of glass, plastics or paper the specification of packing with the material and weight characteristics are to be indicated.	
7.	Each package should have the following inscriptions and signs stenciled with an indelible ink legibly and clearly: a. Destination b. Package Number c. Gross and Net Weight d. Dimensions e. Lifting places f. Handling marks and the following delivery marking	
8.	Each package or shipping units shall be clearly marked or stenciled on at least two sides as follows. BHEL SITE OFFICE NTPC NORTH KARANPURA, 3x660. JHARKHAND. INDIA EPC CONTRACTOR: BHARAT HEAVY ELECTRICALS LIMITED, INDIA" In addition, each package or shipping unit shall have the symbol painted in red on at least two sides of the package, covering one fourth of the area of the side.	
9.	Each part of the equipment which is to be shipped as a separate piece or smaller parts packed within the same case shall be legibly marked to show the unit of which it is part, and match marked to show its relative position in the unit, to facilitate assembly in the field. Unit marks and match marks shall be made with steel stamps and with paint.	



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S. No.	Description	Vendor to confirm
10.	Each case shall contain a packing list showing the detailed contents of the package. When any technical documents are supplied together with the shipment of materials no single package shall contain more than one set of such documents. Shipping papers shall clearly indicate in which packages the technical documents are contained.	
11.	The case number shall be written in the form of a fraction, the numerator of which is the serial number of the case and the denominator the total number of case in which a complete unit of equipment is packed.	
12.	Wherever necessary besides usual inscriptions the cases shall bear special indication such as "Top", "Do not turn over", "Care", "Keep Dry" etc. as well as indication of the center of gravity (with red vertical lines) and places for attaching slings (with chain marks)	
13.	Marking for Safe handling: To ensure safe handling, packing case shall be marked to show the following: a. Upright position b. Sling position and center of Gravity position c. Storage category d. Fragile components (to be marked properly with a clear warning for safe ha	
14.	Each crate or package is to contain a packing list in a waterproof envelope. All items are to be clearly marked for easy identification against the packing List. All cases, packages etc. are to be clearly marked on the outside to indicate the total weight where the weight is bearing and the correct position of the slings are to bear an identification mark relating them to the appropriate shipping documents. All stencil marks on the outside of cases are either to be made in waterproof material or protected by shellac or varnish to prevent obliteration in transit.	
15.	The packing slip shall contain the following information: - Customer name, Name of the equipment, Purchase Order number with Date, Address of the delivery site, Name and Address of the Sender, Serial Number of pump & accessories, BHEL item Code, Gross Weight and Net weight of Supplied items.	
16.	Prior to transport from manufacturer's work to destination, components of the unit shall be completely cleaned to remove any foreign particles. Flange faces and other machined surfaces shall be protected by an easily removable rust preventive coating followed by suitable wrapping.	
17.	All necessary painting, corrosion protection & preservation measures shall be taken as specified in painting schedule. Supplier shall consider the coastal environment zone which is defined as "very severe" during final finishing/shipping.	
18.	Successful bidder shall furnish the detail packing /shipment box details with information like packing box size, type of packing, weight of each consignment,	



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S. No.	Description	Vendor to confirm
	sequence no. of dispatch, no. of consignment for each deliverable item against each billing break up units/ billable blocks. Without these details the BBU shall not be approved during detail engineering. Also, complete billing break-up with above mentioned details shall be submitted within 10days of LOI.	
19.	All items/equipment shall be dispatched in properly packed condition (i.e. no item shall be dispatched in loose condition such that it becomes difficult to store/identify its location at site at a later stage).	
20.	Cases which cannot be marked as above shall have metal tags with the necessary markings on them. The metal tags shall be securely attached to the packages with strong steel binding wire. Each piece, Skid, Case or package shipped separately shall be labelled or tagged properly.	
9.0	SUPERVISION OF ERECTION, TESTING AND COMMISSIONING	Vendor to confirm
1.	The erection of Slurry Pumps will be done by owner as per Erection Manual and check List. However, the bidder shall make one visit per boiler for the supervision of erection, pre-commissioning & post- commissioning check-up, start-up, testing and trial runs of all the items covered under the scope of supply.	
2.	There will be one visit per boiler and totally there will be 3 visits for 3 boilers. The bidder will be informed well in advance for the visit. Bidder shall include 15 working days per visit in the offer with minimum 3 visits.	
3.	TA/DA, boarding and lodging shall be borne by the bidder and shall be inclusive in supply portion.	
10.0	EXCLUSION	Vendor to confirm
	The following work associated with the slurry pump will be by BHEL: a. Civil foundations b. Walkways, platforms and ladders c. Element handling hoists	
11.0	INSPECTION AND TESTING	Vendor to confirm
A)	Minimum Testing requirements to be considered are as below:	
1.	Hydrostatic test is to be conducted at 200% of pump rated head or at 150% of shut off head, whichever is higher for duration of 30 minutes, taking into consideration	



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S. No.	Description	Vendor to confirm
	of the fact that actual operating temperature is 65 deg Celsius (maximum).	
2.	Impeller and rotor shall be first statically balanced and then dynamically balanced according to ISO 1940 (in the case of impellers this shall be done before and after mounting of the service rotor shaft).	
3.	Vibration levels measured on the non-rotating parts shall not exceed the zone limit "B" as defined in ISO 10816 at steady conditions and shall not exceed the zone limit "C" as defined in ISO 10816 at transient conditions.	
4.	List of Non-Destructive test over and above the material test are as follows: a. Casing: Material test, Magnetic particle (MPI), DP and Hydro test as applicable. b. Impeller- DPT and MPI as applicable. c. Shaft- Ultrasonic (UT), DPT and MPI. d. Sleeve- DP and Hardness test / Manufacturer's recommendation. e. Mechanical Seal- Manufacturer's recommendation. f. Base Plate- Stress relieving of weld. g. Replaceable Rubber liner- Spark test, Shore Hardness, Class and Type certificate	
5.	UT on shaft forgings (greater or equal to 40mm) and MPI/DPT shall be done on shafts and impeller to ensure freedom from defects.	
6.	Once mounting is finished and operation less will be conducted on each pump to determine the characteristic curves. For dynamic pressure and volume output, and to determine the parameters at the design point, mechanical running & performance testing shall be performed & witnessed.	
7.	The pump rotating parts shall be subjected to static and dynamic balancing.	
8.	NPSH Test, Vibration test and Noise level test shall be witnessed at shop.	
9.	For surfaces with rubber lining Welding shall be visually inspected to verify the absence of rough area and unacceptable transition between surfaces which prevent the adequate adherence of rubber. The acceptance criteria shall be as per latest standard.	
10.	For surfaces with rubber lining, degree of cleaning shall be visually checked before the application of the coating. There must be no area with oxidation, dirt or partially or generalized corrosion defects.	
11.	Test certificates shall be issued for each lot of raw material used in the coating, corresponding to specific weight and traction resistance.	
12.	For surfaces with rubber lining, adherence test shall be conducted on production samples. Adherence test shall be conducted on the actual surface through hammering. In order to verify the absence of air packets (or) surface without	



**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

NORTH KARANPURA:FGD:SLP:R00

S. No.	Description	Vendor to confirm
	adherence.	
13.	For surfaces with rubber lining, Coating thickness shall be checked at 100%. A High voltage porosity test will be conducted on 100 % of the coated surface.	
B)	General Inspection requirements to be considered are as below:	
1.	Bidder shall furnish written copies of shop production, fabrication and quality test procedures and drawings to be used for review by BHEL / NTPC prior to manufacture. Inspection of above mentioned tests by BHEL/ NTPC representative at bidder's works is envisaged.	
2.	The Bidder shall furnish performance test procedure along with standard. The test procedure will be reviewed and approved by the BHEL/NTPC.	
3.	Slurry Pumps will be inspected at the Bidder's works before dispatch or where the test facilities are available.	
4.	The Bidder shall conduct performance test for the remaining pumps and submit the reports.	
5.	A dynamic balancing certificates stating that the rotating assembly has been balanced dynamically shall be sent to NTPC/ BHEL within one (1) week of the successful completion of balancing.	
6.	Acceptance tolerance of actual versus guaranteed performance for capacity, head, efficiency and power absorbed shall be as per applicable standard.	
7.	Vibration levels shall be measured during shop running/performance tests.	
8.	Contract shaft seals shall be used during shop tests, unless the seal design is unsuitable for the shop-test condition.	
9.	Slurry pumps shall not be released for shipment, until shop tests data and performance tests curves have been approved by Owner.	
10.	Bidder should furnish performance guarantee as per applicable standard guarantee for the design, manufacture, material and safe operation of the equipments.	
11.	BHEL shall witness the test at Bidder's works and a notice of minimum three (3) weeks shall be given for attending the inspection.	
12.	Bidder to arrange all calibrated gauges, Instruments during inspection.	
13.	Mechanical running and the performance test shall be carried out at factory. Bidder to arrange Motor of same / higher rating for the shop test and inspection.	
14.	The performance test may be carried out using water at shop and shall be converted to the design condition.	
12.0	PAINTING	Vendor to confirm



**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

NORTH KARANPURA:FGD:SLP:R00

S. No.	Description	Vendor to confirm
1.	Surface Preparation : Power Tool Cleaning to St3 (SSPC-SP3)	
2.	PRIMER COAT: 1. Primer: Red Oxide Zinc Phosphate Primer to IS: 12744 (Two coats) – DFT: 60 microns. 2. Intermediate: One coat of Synthetic Enamel intermediate coat to IS 2932; DFT- 50μ	
3.	FINISH COAT: Two coats of Synthetic Enamel to IS 2932, DFT- 50μ/ coat Total DFT : 100 micron.	
4.	COLOUR CODE (based on DIN 2403:2007-05 & DIN 5381) a. Base: To be informed during contract stage b. Lettering: To be informed during contract stage.	
	Corrosion protection, coating and galvanizing, painting shall be taken care by the bidder. Bidder shall submit the painting scheme during detail Engg in line with the specification and shall be subject to approval of BHEL / NTPC.	
13.0	SPARES,TOOLS & TACKLES	
13.1	START UP & COMMISSIONING SPARES	Vendor to confirm
	Start-up & Commissioning Spares shall be part of the main supply of the Slurry pumps. Start-up & commissioning spares are those spares which may be required during the start- up and commissioning of the equipment/system. All spares required for successful operation till commissioning of pump shall come under this category. Bidder shall provide an adequate stock of such start up and commissioning spares to be brought by him to the site for the equipment erection and commissioning. The spares must be available at site before the equipments are energized. The List of such spares to be provided during bidding stage. These start-up & commissioning spare part list shall not be included in "Initial Spare Parts List". Temporary strainers shall be supplied for all pumps as commissioning spare mandatorily.	
13.2	FINAL SPARES(RECOMMENDED SPARES)	Vendor to confirm
	Bidders shall also furnish the Final Spares Part List (i.e. recommended spares list) along with the offer required for 3 years of normal operation of the plant and should be independent of the list of the mandatory spares. Prices of recommended spares will not be used for evaluation of the bids. The price of these spares will remain valid up to 6 months after placement of Notification of Award for the main equipment.	



**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

NORTH KARANPURA:FGD:SLP:R00

S. No.	Description	Vendor to confirm
13.3	MANDATORY SPARES:	Vendor to confirm
	Bidder to quote mandatory spare with break up price. 1. Impeller Assembly 2 nos. of each type 2. Casing Liners 3 nos. of each type 3. Seals 3 sets of each type 4. Bearings 3 nos. of each type 5. Motor -1 no of each type. 6. Motor-Pump Coupling -3 nos. of each type Bidder shall quote for the "Initial Spares Part List", and it will be considered for L1 evaluation. Initial spare parts items shall be handed over separately and shall not be mixed with the supply of the main equipment parts. Spares shall be sent in pre-decided lots in containers/secure boxes. All boxes/containers are to be distinctly marked in red color with boldly written "S" mark on each face of the containers. Spares shall not be dispatched before dispatch of corresponding main equipments. Each item shall be labelled in English and be packed against damage and sealed to prevent deterioration from corrosion. The protection shall be sufficient for a minimum of 10 years' storage in a dry weatherproof building. All spares supplied under this contract shall be strictly inter-changeable with the parts for which they are intended for replacements. All the Initial spares shall be manufactures along with the main equipment components as a continuous operation as per same specification and quality plan. Any special tools & tackles required for the entire equipment to disassemble, assemble or maintain the units, they shall be included in the quotation and furnished as part of the initial supply of the machine. List of special tools & tackles shall be decided by bidder as per his proven practice. When special tools are provided, they shall be packaged in separate, boxes with lugs and marked as "Special Tools for (tag / item number)." Each tool shall be stamped or tagged to indicate its intended usage. Levers and eye bolts for the removal of parts to be serviced shall be submitted with special tools.	
13.4	SPECIAL TOOLS & TACKLES:	Vendor to confirm
	Any special tools & tackles required for the entire equipment to disassemble, assemble or maintain the units, they shall be included in the quotation and furnished as part of the initial supply of the machine. List of special tools & tackles shall be decided by bidder as per his proven practice. When special tools are provided, they shall be packaged in separate, boxes with lugs and marked as "Special Tools for (tag / item number)." Each tool shall be stamped or tagged to indicate its intended usage. Levers and eye bolts for the removal of parts to be serviced shall be submitted with special tools.	
14.0	PERFORMANCE GUARANTEE	Vendor to



**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

NORTH KARANPURA:FGD:SLP:R00

S. No.	Description	Vendor to confirm
		confirm
	All performance tests for Slurry pumps shall be carried out in accordance with any latest international codes/standards. 1) Bidder shall furnish Performance guarantee for the design, manufacture, material, safe and trouble-free operation of the Slurry pump and its accessories 2) Bidder shall guarantee and demonstrate the rated capacity of the pump at the rated head. 3) The Bidder shall ensure a design of the equipment to achieve an average target availability of 98% for 120 days and average target availability of 95% for 1 year. 4) The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement. All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hrs. 5) Noise level ≤ 85 dB (A) at 1m horizontal distance from equipment/enclosures and 1.5m above operating floor is to be guaranteed. 6) Vibration levels measured on the non-rotating parts shall not exceed the zone limit "B" as defined in ISO 10816 at steady conditions and shall not exceed the zone limit "C" as defined in ISO 10816 at transient conditions. 7) Acceptance tests to be carried out as per the procedure defined by the bidder which shall be submitted for BHEL/ NTPC approval. 8) In the event that the performance test is unsuccessful, bidder shall take necessary remedial action at his cost and the performance test shall be repeated.	
15.0	BID EVALUATION CRITERIA FOR POWER CONSUMPTION:	Vendor to confirm
1.	POWER GUARANTEE Bidder to specify the guaranteed power consumption at motor input terminal per Pump operating at the duty point in their offer.	
2.	BID EVALUATION CRITERIA FOR POWER CONSUMPTION: Power loading shall be applicable for the following slurry pumps: 1.GYPSUM BLEED PUMP	



**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

NORTH KARANPURA:FGD:SLP:R00

S. No.	Description	Vendor to confirm
	2.FILTRATE WATER PUMP 3.SECONDARY HYDROCYCLONE FEED TANK PUMP 4.WASTE WATER PUMP 5.LIMESTONE SLURRYT FEED PUMP 6.PRIMARY HYDROCYCLONE FEED TANK PUMP Guaranteed shaft power consumption at motor input terminal shall be quoted by bidder. Lowest quoted guaranteed power consumption will be taken as base value. Bid prices of other bidders will be loaded @ USD 2230 for every KW excess over the base value as per the formula given below. Adjustment factor for excess power consumption in USD = (GPC-BV) X PL x No's of Working pumps GPC- Guaranteed Power Consumption quoted by bidder in KW BV- base Value i.e. lowest quoted power consumption in KW PL- Power Loading @ USD 2230/KW Exchange rate as applicable on bid opening date will be considered.	
16.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION	Vendor to confirm
1.	If actual Power Consumption at motor input terminal during prove out (or) PG Test operating at the duty point exceeds the value guaranteed by the bidder, liquidated damages for shortfall in performance shall be deducted from contract price as per the formula given below Liquidated damage deductible in INR = (APC-GPC) X P X No's of Total working pumps Where • GPC- Guaranteed Power Consumption quoted by bidder in KW • APC- Actual Power Consumption in KW • P- Penalty @ USD 3275 per KW	
2.	Minimum Acceptance Level: 120% of Functional Guarantee Value. NTPC/BHEL reserves the right to reject the equipment if actual power consumption exceeds the minimum acceptance level.	
17.0	DEFECT LIABILITY & WARRANTY	Vendor to



**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

NORTH KARANPURA:FGD:SLP:R00

S. No.	Description	Vendor to confirm
		confirm
1.	The Bidder warrants that the equipments/items shall be free from defects in the design, engineering, materials and workmanship of the Plant and Equipment supplied and of the work executed. The Defect Liability Period shall be Thirty six (36) months from the date of delivery or Twenty four (24) months from the date of commissioning, whichever first occurs. If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the Plant and Equipment supplied or of the work executed by the Bidder, the Bidder shall promptly, in consultation and agreement with BHEL regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good (as the Bidder shall, at its discretion, determine) such defect as well as any damage to the Facilities caused by such defect.	
2.	In case of failure of the equipment to meet the guarantee, NTPC/BHEL reserves the right to reject the equipment. However, NTPC/BHEL reserves the right to use the equipment until new equipment supplied by bidder meets the guaranteed requirement .	
18.0	FIRST FILL OF CONSUMABLES:	Vendor to confirm
1.	Bidder's scope shall also include supply and filling of all chemicals, reagents, resins, lubricants, grease, filters and consumable items for operation up to commissioning including top up requirements. All lubricants proposed for the plant operation shall be suitable for all operating and environmental conditions that will be met on site consistent with good maintenance procedures as instructed in the maintenance manuals.	
2.	Detailed specifications for the lubricating oil, grease, gases, servo fluids, control fluids, chemicals including items qualities and quantities required per month of the plant operation for the NTPC/BHEL's approval herein shall be furnished within 2 months of placement of Order. On completion of erection complete list of bearings/equipment giving their location and identification marks shall be furnished to BHEL along with lubrication requirements. All types of chemicals, consumables, lubricants and grease shall be readily obtainable locally and the number of different types shall be kept to a minimum. For each type and grade of lubricant recommended, bidder shall list at least three equivalent lubricants manufactured by alternative companies.	
19.0	TRAINING	Vendor to confirm
	Successful bidder shall provide comprehensive training for NTPC/BHEL Engineering, O&M, Erection & Commissioning staffs at site covering all aspects of the Slurry pumps - Operation & Maintenance, Troubleshooting etc.	



**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

NORTH KARANPURA:FGD:SLP:R00

S. No.	Description	Vendor to confirm
20.0	CONFLICT	Vendor to confirm
	Bidder's equipment shall be designed for and shall meet the service, performance and minimum level of quality requirements specified. Bidder shall be solely responsible for advising NTPC in writing of any conflicts between the specifications and Bidder's design, including performance and levels of quality. Bidder agrees that its obligations, liabilities and warranties shall not be diminished or extinguished due to its meeting the requirements of the Specification.	
21.0	DOCUMENTATION	Vendor to confirm
A	DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER	
	The Bidder shall submit all documents, drawings, diagrams and all such information, which are necessary to fully understand the offer for techno – commercial evaluation. As a minimum requirement bidder shall offer the documents as specification in ANNEXURE-V	
B	DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT	Vendor to confirm
	The Successful bidder shall submit necessary data, documents and drawings for review, approval with requirements specified as per ANNEXURE-V Erection schedule and component list. Drawings that are reviewed by the NTPC/ BHEL will be returned to bidder with a transmittal letter with any comments and / or questions marked on the drawings or noted in the letter. All comments and questions must be resolved before a resubmission of drawings / documents. If the design has not developed enough to resolve some of the comments or questions, bidder shall place a “hold” on those items or areas of design. NTPC/ BHEL reserves the right to return drawings unprocessed to bidder if there exists any evidence that bidder has not acknowledged all comments and questions. All necessary GA drawings, sections, sub-assembly drawings, specifications of main and sub components and necessary set of operation & maintenance manual as asked by NTPC must be furnished by bidder in soft and hard copy forms. For all documents softcopy format shall be searchable pdf, however in addition all drawings, diagrams like P&IDs shall be supplied in ACAD or other editable format and all lists in Excel format. Further break up of technical documents will be discussed during finalization of the purchase contract. Unless agreed otherwise, Ten (10) hard copies and five (05) sets of electronic copies of all documents are to be submitted in the English language. Electronic Copies shall be submitted in primary original data format (e.g. DOC, XLS, DWG) as	



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NORTH KARANPURA:FGD:SLP:R00

S. No.	Description	Vendor to confirm
	well as in a printable non-proprietary document format (e.g. PDF). Especially P&IDs shall be submitted as DWG files and PDF files. Bidder to ensure submission of hard copies as per NTPC requirement for all engineering drg/doc and for all subsequent revisions along with a soft copy through email to concerned project team. However all the engineering related information shall be furnished in soft form to BHEL.	



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NTPC-NORTH KARANPURA (3X660 MW)**

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22. REFERENCE DOCUMENTS

NTPC MOTOR SPECIFICATION



**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

NORTH KARANPURA:FGD:SLP:R00

23.0 ANNEXURES

ANNEXURE-I Qualification requirement

(REFER QR WITH ATTACHMENT 3K)

Annexure- II

[illegible]

[illegible]



**TECHNICAL SPECIFICATION OF SLURRY PUMP
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NORTH KARANPURA:FGD:SLP:R00

ANNEXURE III- SCHEDULE OF GUARANTEES (to be repeated and filled by bidder for each type of pump)

Sl. No	Description	Data
1.	Pump name	: Bidder to provide
2.	Rated capacity of pump m ³ /hr	: Bidder to provide
3.	Total head at rated capacity MLC	: Bidder to provide
4.	Guaranteed power consumption at motor input terminal per pump at rated capacity & head kW	: Bidder to provide
5.	Noise level at a distance of 1.0 meter horizontally from the equipment at site and 1.5 m above operating floor dB(A)	: Bidder to provide
6.	Maximum vibration (peak to peak amplitude at site) microns	: Bidder to provide
7.	Equipment Availability (%)	
	Equipment availability for 120 days %	: Bidder to provide
	Equipment availability for 1 year %	: Bidder to provide
8.	Pump Efficiency %	: Bidder to provide
9.	Guaranteed life of all pump wear parts including casing liners, bearing, etc. Hours	: Bidder to provide

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----



TECHNICAL SPECIFICATION OF SLURRY PUMP
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NORTH KARANPURA:FGD:SLP:R00

ANNEXURE IV- VENDOR TO PROVIDE THE LIST OF COMMISSIONING SPARES

Sl. No.	Description	Quantity
1.		
2.		
3.		
4.		
5.		

Qty will be Number or Set as applicable

- Vendor to identify each and every item which they consider as commissioning spares. Each and every part that is considered to fall under guarantee clause shall be indicated in this list.
- Rubber items which are having a **Shelf-Life** will also be considered as wear item.

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----



TECHNICAL SPECIFICATION OF SLURRY PUMP
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ANNEXURE – V

a) REFERENCE LIST as per format shown below:

S.N o	Project Name , Customer & Plant capacity	Coal fired Yes/No	Wet Limest one Based FGD Yes/No	Model	Type / Hor / Vertical	Flow Cu. M/Hr	Head M	Year of Commg	Qty

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----



TECHNICAL SPECIFICATION OF SLURRY PUMP
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NORTH KARANPURA:FGD:SLP:R00

ANNEXURE – VI- LIST OF DEVIATIONS/EXCEPTIONS TO THE ENQUIRY DOCUMENT

SI No	Clause No	Page No	Description of Deviation

Note: Enlarge the table to incorporate items

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----



**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

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ANNEXURE -VII

A) DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER:

Sl. No.	Description	No of copies With proposal
1.	Complete compliance to the specification.	1
2.	Annexure-I along with attachment 3K,	1
3.	Annexure-II (DATE SHEET)	1
4.	Annexure-III	
5.	Annexure-IV	
6.	Annexure-V	
7.	Deviation list Annexure-VI	
8.	Annexure-VII	
9.	Annexure-VIII (Sea worthy packing)	
10.	Annexure-IX	
11.	Annexure-X	
12.	Performance curve (Head vs flow, NPSH/flow ,T-S curve).	1
13.	Proforma Packing List	1
14.	Shortest Manufacturing Time	1
15.	Approximate weight of each skid	1
16.	Reference plant details	1
17.	Required Electric power & other Utility List	1
18.	General Assembly Drawing	1
19.	Pump and Motor Sizing Calculation	1
20.	Cross-sectional Drawing	1
21.	Sub-Vendor List	1
22.	Quality Plan	1
23.	Spare List (Mandatory, Recommended)	1
24.	Start-up & Commissioning Spares	1
25.	List of Special Tools	1
26.	Delivery Schedule	1
27.	Test Arrangement & Test procedure	1
28.	T-S curve	1
29.	Hoist/Crane requirement	1



TECHNICAL SPECIFICATION OF SLURRY PUMP
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30.	P & I Diagram	1
31.	Catalogue	1

B) DOCUMENTS TO BE SUBMITTED AFTER CONTRACT:

Sl. No.	Description	No of copies After award of contract	Delivery Time
1.	Utility Consumption	1	2 weeks after contract
2.	Foundation Data including Anchor plan	1	2 weeks after contract
3.	Performance curve (Head vs flow) NPSH/Flow, T-S curve)	2	2 weeks after contract
4.	Assembly drawings of each equipment	1	1 month after contract
5.	Cross section detail drawing	1	1 month after contract
6.	Data Sheet	1	2 weeks after contract
7.	Annexure to qualification requirement- Attachment 3K.	1	2 weeks after contract
8.	Lubricating oil list	1	2 months after contract
9.	Special tools list	1	2 months after contract
10.	Installation and assembly procedure	1	4 months after contract
11.	Inspection and Test Procedure	1	1 month after contract
12.	Inspection & Test record	1	In 2 weeks after test
13.	Inspection Certificate	1	In 2 weeks after test
14.	Sub vendors List	1	2 weeks after contract
15.	Manufacturing Schedule	1	2 weeks after contract
16.	Progress report	1	Every month
17.	Proforma Packing List	1	2 months prior to shipping
18.	Approximate weight of each skid	1	2 months after contract
19.	Required Electric power	2	2 weeks after contract
20.	Pump and Motor Sizing Calculation Bearing selection	1	2 weeks after contract
21.	Material Test Certificates	2	In 2 weeks after test
22.	Pre Commissioning Check List	2	4 months after contract
23.	Quality Plan	4	1 month after contract



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Sl. No.	Description	No of copies After award of contract	Delivery Time
24.	Operation and Maintenance Manual	• 10 hardcopies and 5 electronic copies in English	4 months after contract
25.	Spare List (Mandatory, Recommended)	1	1 month after contract
26.	Start-up & Commissioning Spares	2	1 month after contract
27.	List of Special Tools	1	1 month after contract
28.	Delivery Schedule	1	2 weeks after contract
29.	Test Arrangement & Test procedure	2	1 month after contract
30.	T-S curve	2	2 weeks after contract
31.	P & I Diagram	2	2 weeks after contract
32.	Catalogue	2	2 weeks after contract

SIGNATURE OF BIDDER

NAME

DESIGNATION

BIDDER SIGN WITH SEAL AND DATE



**TECHNICAL SPECIFICATION OF SLURRY PUMP
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NORTH KARANPURA:FGD:SLP:R00

ANNEXURE-VIII

TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING

Refer to Specification No: PE-TS-888-100-A001 for detailed specification on Seaworthy packing.

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----



TECHNICAL SPECIFICATION OF SLURRY PUMP NTPC-NORTH KARANPURA (3X660 MW)

NORTH KARANPURA:FGD:SLP:R00

ANNEXURE-IX

INSPECTION & TESTING

Refer to all clauses for Inspection & testing requirements.

Sl. no.	Item	Category	Unit of Quantity	Quantity	Component
1	Material Test	Shop Inspection	Set		
2	DP Test	Shop Inspection	Set		
3	Radiographic	Shop Inspection	Set		
4	Magnetic Particle Test	Shop Inspection	Set		
5	Ultrasonic	Shop Inspection	Set		
6	Hydro test	Shop Inspection	Set		
7	Inter Granular Corrosion Test	Shop Inspection	Set		
8	Dynamic Balancing Test	Shop Inspection Testing	Set		
9	Performance Test (Internal)	Shop Testing	Set		
10	Power measurement at situ	Site Testing	Set		
11	Vibration Test	Shop Testing	Set		
12	Vibration Test	Site Testing	Set		
13	Noise Test	Shop Testing	Set		
14	Noise Test	Site Testing	Set		

Note:

- Enlarge the table to incorporate items
- Set to be interpreted as a complete unit

Sample QP is enclosed. However, final QP will be subject to end customer approval. For foreign vendors, inspection has to be arranged at bidder's cost by internationally reputed third party inspection agencies like TUV SUD, Lloyds Register, Bureau Veritas, Certification Engineers International etc., at bidder's cost for carrying out inspection at bidder's works and their sub-vendor works.

SIGNATURE OF BIDDER _____

NAME _____

DESIGNATION _____

BIDDER SIGN WITH SEAL AND DATE



**TECHNICAL SPECIFICATION OF SLURRY PUMP
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NORTH KARANPURA:FGD:SLP:R00

ANNEXURE – IX(a) - LIST OF TESTS FOR WHICH REPORTS HAVE TO BE SUBMITTED:

The following type test reports shall be submitted for each type and rating of LT motor of above 50 KW only

1. Measurement of resistance of windings of stator and wound rotor.
2. No load test at rated voltage to determine input current power and speed
3. Open circuit voltage ratio of wound rotor motors (in case of Slip ring motors)
4. Full load test to determine efficiency power factor and slip.
5. Temperature rise test.
6. Momentary excess torque test.
7. High voltage test.
8. Test for vibration severity of motor.
9. Test for noise levels of motor:
 - Noise level for all the motors shall be limited to 85dB (A) except for BFP motor for which the maximum limit shall be 90 dB(A). Vibration shall be limited within the limits prescribed in IS/IEC 60034-14. Motors shall withstand vibrations produced by driven equipment. HT motor bearing housings shall have flat surfaces, in both X and Y directions, suitable for mounting 80mmX80mm vibration pads.
10. Test for degree of protection
11. Over speed test.
12. Type test reports for motors located in fuel oil area having flame proof enclosures as per IS 2148 / IEC 60079-1
 - All acceptance and routine tests as per the specification and relevant standards shall be carried out. Charges for these shall be deemed to be included in the equipment price.
 - The type test reports once approved for any projects shall be treated as reference. For subsequent projects of NTPC, an endorsement sheet will be furnished by the manufacturer confirming similarity and “No design Change”. Minor changes if any shall be highlighted on the endorsement sheet.



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NTPC-NORTH KARANPURA (3X660 MW)**

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ANNEXURE –X - LT MOTOR DATASHEET

NTPC format- LT motor Data sheet

DE-1	LT MOTORS	
A.	GENERAL	
1.	Manufacturer & Country of origin.	
2.	Equipment driven by motor	
3.	Motor type	
4.	Quantity	
B.	DESIGN AND PERFORMANCE DATA	
1.	Frame size	
2.	Type of duty	
3.	Type of enclosure /Method of cooling/ Degree of protection	
4.	Applicable standard to which motor generally conforms	
5.	Efficiency class as per IS 12615	
6.	(a)Whether motor is flame proof	
	(b)If yes, the gas group to which it conforms as per IS:2148	
7.	Type of mounting	
8.	Direction of rotation as viewed from DE END	
9.	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10.	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11.	Maximum continuous load demand of driven equipment in KW	
12.	Rated Voltage (volts)	
13.	Permissible variation of :	
	a. Voltage (Volts)	
	b. Frequency (Hz)	
	c. Combined voltage and frequency	
14.	Rated speed at rated voltage and frequency(RPM)	
15.	At rated Voltage and frequency:	
	a. Full load current	
	b. No load current	
16.	Power Factor at	



TECHNICAL SPECIFICATION OF SLURRY PUMP NTPC-NORTH KARANPURA (3X660 MW)

NORTH KARANPURA:FGD:SLP:R00

	a. 100%/75%/50% load	
	b. NO load	
	c. Starting.	
17.	Efficiency at rated voltage and frequency,	
	a.100% load	
	b. 75% load	
	c. 50% load	
18.	Starting current (amps) at	
	a. 100 % voltage	
	b. 85% voltage	
	c. 80% voltage	
19.	Minimum permissible starting Voltage (Volts)	
20.	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
	a. Without driven equipment coupled	
	b. With driven equipment coupled	
21.	Safe stall time with 100% ,110% & 80% of rated voltage	
	a. From hot condition	
	b. From cold condition	
22.	Torques :	
	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
	b. Pull up torque at rated voltage.	
	c. Pull out torque	
	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
	e.Rated torque (kg.m)	
23.	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24.	GD ² value of motors	
25.	No of permissible successive starts when motor is in hot condition	
26.	Locked Rotor KVA Input	
27.	Locked Rotor KVA/KW	



**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

NORTH KARANPURA:FGD:SLP:R00

28.	Vibration limit :Velocity (mm/s)	
29.	Noise level limit (dBA)	
C.	CONSTRUCTIONAL FEATURES	
1.	Stator winding insulation	
	a. Class & Type	
	b. Winding Insulation Process	
	c. Tropicalised (Yes/No)	
	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
	e. Method of temperature measurement	
	f. Stator winding connection	
2.	Main Terminal Box	
	a. Type	
	b. Location(viewed from NDE side)	
	c. Entry of cables(bottom/side)	
	d. Recommended cable size(To be matched with cable size envisaged by owner)	
	e. Fault level (MVA),Fault level duration(sec)	
	f. Cable glands & lugs details (shall be suitable for power cable)	
3.	Type of DE/NDE Bearing	
4.	Motor Paint shade	
5.	Weight of	
	a. Motor stator (KG)	
	b. Motor Rotor (KG)	
	c. Total weight (KG)	
D.	List of accessories.	
1.	Space Heaters (Nos./Power in watts/supply voltage)	
2.	Terminal Box for Space Heater (Yes/No)	
3.	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4.	Insulation of bearing (Yes/No)	
5.	Noise reducer(Yes/No)	



**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

NORTH KARANPURA:FGD:SLP:R00

6.	Grounding pads	
	i) No and size on motor body	
	ii) Nos on terminal Box	2
7.	Any other fitments	
E.	List of curves.	
1.	Torque speed characteristic of the motor	Attached
2.	Thermal withstand characteristic	Attached
3.	Starting. current Vs. Time	Attached
4.	Starting. current Vs speed	Attached
5.	P.F. and Effi. Vs Load	Attached

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----



**TECHNICAL SPECIFICATION OF SLURRY PUMP
NTPC-NORTH KARANPURA (3X660 MW)**

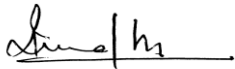
NORTH KARANPURA:FGD:SLP:R00

ANNEXURE-XI

REFER SUB VENDOR QUESTIONNAIRE AND APPROVED LT MOTOR VENDORS

 Ranipet		MANUFACTURER'S NAME AND ADDRESS M/S BHEL: BAP: RANIPET 632 406 TAMIL NADU		STANDARD QUALITY PLAN										
				ITEM: SLURRY PUMP SYSTEM: FGD					QP NO		FGS:724			
									REV. NO:		00			
									DATE:		12.02.2019			
						PAGE NO:		Page 1 of 3						
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N				D*	M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			11.

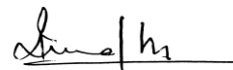
1.0	RAW MATERIAL												
1.1	a) Volute Casing b) Wear Plate C) Impeller	Chemical & mechanical properties	Major	Composition analysis & mechanical properties test	1 Per Heat No	Approved GA Drawing / Data Sheet		Raw Material TC/COC	√	P	V	V	Tensile Test Is Applicable For Volute Casing Only.
1.2	Shaft	1)Chemical Composition 2)Mechanical Properties	Major	Composition analysis & mechanical properties test	1 Per Heat No	Approved GA Drawing / Data Sheet		Material Test Report	√	P	V	V	
		UT Test	Major	NDT	100%	ASTM A 388	ASME Sec V	Test Report	√	P	V	V	Shafts Ø40mm are UT tested.
2.0	IN PROCESS INSPECTION												
2.1	Impeller	Surface Defect	Major	DPT on machined surfaces	100%	ASTM E 165	ASME Sec V	Insp Report	√	P	V	V	
	Shafts after machining	Surface Defect	Major	DPT	100%	ASTM E 165	ASME Sec V	Insp Report	√	P	V	V	
2.2	Impeller & Shaft	Residual Unbalance	Major	Static & Dynamic Balancing	100%	Relevant Standard/ISO 1940 Gr 2.5		Insp Report	√	P	V	V	
2.3	Casing	Soundness	Major	Hydrostatic test	100%	No leakage		Insp Report	√	P	V	V	At 200% Of Pump Rated

LEGEND: * RECORD, IDENTIFIED WITH "TICK" (√) UNDER COLUMN 'D' SHALL BE SUBMITTED TO CUSTOMER AS A QA DOCUMENTATION PACKAGE. M: MANUFACTURER / SUB SUPPLIER, C: MAIN CONTRACTOR. N: CUSTOMER/CONSULTANT P: PERFORM W: WITNESS V: REVIEW OF RECORDS MA: MAJOR AND MI: MINOR	PREPARED BY  Rakesh Kumar Madhu,(SEr/QA)	REVIEWD & APPROVED BY  K C Gandhi Parimalam,(DGM/QA)
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 Ranipet		MANUFACTURER'S NAME AND ADDRESS M/S BHEL: BAP: RANIPET 632 406 TAMIL NADU		STANDARD QUALITY PLAN										
				ITEM: SLURRY PUMP SYSTEM: FGD						QP NO		FGS:724		
										REV. NO:		00		
										DATE:		12.02.2019		
						PAGE NO:		Page 2 of 3						
SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N				D*	M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			11.
														Head Or 150% Of Shut Off Head, Whichever Is Higher, for at least 30min.
2.4	Motor	Make, Type, Rating	Major	Visual	100%		Approved Drawing / Data Sheet	Routine Test Report/COC	√	P	V	V		Motor Up to 30kw COC Will Be Provided.
3.0 FINAL INSPECTION														
3.1	Complete Pump	Dimensions	Major	Measurement & Visual	100%		Manufacturer Drawing	Inspection Report	√	P	W	W		
3.2	Performance Test	1)Flow, Head, Efficiency, BHP at Rated Speed 2)Vibration and Noise Level 3)Leakage Test	Major	Measurement & Visual	100%	1/mod el	Approved Drawing / Data Sheet	Insp Report	√	P	W **	W*		
		Strip Down Test Not Required If Performance Test Is Fine	Major	Visual	100%	1/mod el	Mfg. Drawing, Approved Data Sheet		√	P	W	W		Only Required in Case of Abnormal Sound

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MA: MAJOR AND **MI:** MINOR

PREPARED BY



Rakesh Kumar Madhu,(SEr/QA)

REVIEWD & APPROVED BY



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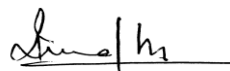
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SL. NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			11.
3.3	Painting Check	DFT, Paint Shade	Major	Measurement And Visual	100%	Rando m	Approved Painting scheme	Insp Report	√	P	W	V	Quality Dossier To Be Submitted Finally.	

NOTE:

1. For Slurry Pump Motor Rating is 37KW and motor make NTPC/BHEL Approved source.
2. Routine test report duly witnessed by main contractor as per applicable standard shall be reviewed during inspection (more than 30KW Rating).

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PREPARED BY



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REVIEWD & APPROVED BY



K C Gandhi Parimalam,(DGM/QA)

Sl. No	Schedule of Guarantees - Parameter Description	Data to be provided by the bidder.
1	Pump Name (Bidder to provide)	
2	Rated capacity of pump in m ³ /hr	
3	Total head at design capacity in MLC	
4	Guaranteed power consumption at motor input terminal per pump at rated capacity & head in kW	
5	Noise level at a distance of 1.0 meter horizontally from the equipment at site and 1.5 m above operating floor in dB(A)	
6	Maximum vibration (peak to peak amplitude at site) in microns	
7	Equipment Availability (%) Equipment availability for 120 Days in % Equipment Availability for 1 Year in %	
8	Pump Efficiency (%)	
9	Guaranteed life of all pump wear parts including casing liners, bearings, etc., in Hours	

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6	Maximum vibration (peak to peak amplitude at site) in microns	
7	Equipment Availability (%) Equipment availability for 120 Days in % Equipment Availability for 1 Year in %	
8	Pump Efficiency (%)	
9	Guaranteed life of all pump wear parts including casing liners, bearings, etc., in Hours	

SLNO	PARAMETERS/TECHNICAL INFORMATION OF SLURRY AND PUMP DATA SHEET for Gypsum bleed pump	Bidder's Conformation
1	Pump & Motor shall be designed with discharge valve fully open & close conditions - Vendor to confirm	
2	pump model offered to be mentioned by vendor	
3	NPSHr to be indicated by vendor	
4	Pump performance curves Flow v/s Head , ii. Flow v/s NPSH iii. Flow v/s Efficiency, iv. Flow v/s power, (v) Flow vs NPSHr - are to be submitted along with offer by vendor for evaluating the Bid	
5	General Arrangement drawings with material of construction, important dimensions- to be submitted along with offer by vendor for evaluating the Bid	
6	All mounting bolts and foundation bolts are made up of minimum SS 304 (vendor scope & vendor to confirm)	
7	Inlet and outlet dia of pump	
8	Impeller diameter	
9	Tip speed vendor to specify (less than 30m/s)	
10	GD ² at drive end of the shaft to furnished	
11	All bearing of pump and motor are FAG/SKF only vendor to confirm	
12	Bearing cooling air /oil/water - if any required vendor to specify	
13	Pump efficiency (minimum expected 65% for horizontal pumps and min 45% for vertical pumps) Vendor to specify	
14	Rated RPM of the pump - should not exceed 1500RPM (vendor to confirm)	
15	The operating speed shall be atleast 20% higher than first critical speed - and Second speed should be 130 % higher than operating speed vendor to confirm	
16	The operating range of the pump shall be 40% to 120% of the duty point - vendor to confirm	
17	The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the duty point flow	
18	Shut-off head is minimum 15% higher than the duty point head- vendor to confirm	
19	Common base plate to be provided by vendor A/29/A36 /A283/IS2062 or equivalent international standard	
20	Vibration pad required (between base plate and pump & motor) vendor to provide & confirm	
21	Pump casing ,Wear plate and cover cover plate and all slurry wetted part shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. Also, bidder can offer high chrome alloy lined pump (ASTM 532 Grade IIIA (30Cr) with minimum hardness 600-650 BHN or better material) if bidder has previous experience. Bidder to confirm.	
22	The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement.Bidder to confirm.	
23	All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hours.Bidder to confirm.	

24	Impeller high chrome alloy ASTM 532 Grade IIIA (30Cr)with minimum hardness 600-650 BHN- vendor to confirm	
25	Impeller mounting bolt and nut shall be Duplex 2205 - vendor to confirm	
26	Main drive shaft (single piece from coupling to impeller) material Duplex S32205/S31803 or vendor to confirm	
27	Shaft sleeve at mechnaical mechanical seal portion shall be CD4MCu ASTM A 743 or better material - vendor to confirm	
28	Key material for impeller mounting minimum SS 316- vendor to confirm	
29	Name plate shall be in SS 304 - vendor to confirm	
30	Rotation arrow to be cast in the body or arrow plate with SS304 to be fixed on the pump - vendor to confirm	
31	Direct Drive flexible coupling with high tensile bolts is to be provided by vendor (belt drive not acceptable). Coupling make and model Number Coupling drawing with BOM to be provided after purchase order. Vendor to confirm	
32	Coupling guards with mounting bolt(SS304) to be provided	
33	Mechanical seal life minimum 25,000 hrs Vendor to confirm	
34	Mechanical drawing with complete BOM to be provided after purchase order.	
35	Temporary conical strainer to be provided - vendor to confirm	
36	Mechanical seal flushing provision to be provided (If applicable) by vendor at inlet/outlet with G 1/4 pipe connection -vendor to confrim	
37	Fushing water Quantity , qaulity & pressure will be inforemed by the vendor	
38	pump shaft power for each pump to be provided	
39	safety factor 1.1 minimum required vendor to confirm	
40	Motor efficiency class (minium IE3)	
41	Guranteed power consumption in KW (Backup calculation for power consumption to be provided)	
42	Motor rating to be furnished for all motor along with backup calculation	
43	At pump Inlet & outlet non metallic Expansion joint with flang and fasteners to be provided	
44	Drain pipe with valve to be provided at the bottom of casing- vendor to confirm	
45	First fill oil /grease other consumable to be sent along with pump - vendor to confirm	
46	Painting : 1).Red Oxide Zinc Phosphate Primer - (Two coats 60 +60 μ). 2).One coat of Synthetic Enamel intermediate (50μ) 3).Synthetic Enamel to IS 2932, (two coat 50+50μ) colour:Light blue RAL 5012- total DFT 210μ	
47	Performance test - if test flow medium is water , then density of slurry is to be considered while arriving final values vlaues of head,flow and power consumption - vendor to confirm	

SLNO	PARAMETERS/TECHNICAL INFORMATION OF SLURRY AND PUMP DATA SHEET for Emergency Transfer Pump	Bidder's Conformation
1	Pump & Motor shall be designed with discharge valve fully open & close conditions - Vendor to confirm	
2	pump model offered to be mentioned by vendor	
3	NPSHr to be indicated by vendor	
4	Pump performance curves Flow v/s Head , ii. Flow v/s NPSH iii. Flow v/s Efficiency, iv. Flow v/s power, (v) Flow vs NPSHr - are to be submitted along with offer by vendor for evaluating the Bid	
5	General Arrangement drawings with material of construction, important dimensions- to be submitted along with offer by vendor for evaluating the Bid	
6	All mounting bolts and foundation bolts are made up of minimum SS 304 (vendor scope & vendor to confirm)	
7	Inlet and outlet dia of pump	
8	Impeller diameter	
9	Tip speed vendor to specify (less than 30m/s)	
10	GD ² at drive end of the shaft to furnished	
11	All bearing of pump and motor are FAG/SKF only vendor to confirm	
12	Bearing cooling air /oil/water - if any required vendor to specify	
13	Pump efficiency (minimum expected 65% for horizontal pumps and min 45% for vertical pumps) Vendor to specify	
14	Rated RPM of the pump - should not exceed 1500RPM (vendor to confirm)	
15	The operating speed shall be atleast 20% higher than first critical speed - and Second speed should be 130 % higher than operating speed vendor to confirm	
16	The operating range of the pump shall be 40% to 120% of the duty point - vendor to confirm	
17	The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the duty point flow	
18	Shut-off head is minimum 15% higher than the duty point head- vendor to confirm	
19	Common base plate to be provided by vendor A/29/A36 /A283/IS2062 or equivalent international standard	
20	Vibration pad required (between base plate and pump & motor) vendor to provide & confirm	
21	Pump casing ,Wear plate and cover cover plate and all slurry wetted part shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. Also, bidder can offer high chrome alloy lined pump (ASTM 532 Grade IIIA (30Cr) with minimum hardness 600-650 BHN or better material) if bidder has previous experience. Bidder to confirm.	
22	The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement.Bidder to confirm.	
23	All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hours.Bidder to confirm.	

24	Impeller high chrome alloy ASTM 532 Grade IIIA (30Cr)with minimum hardness 600-650 BHN- vender to confirm	
25	Impeller mounting bolt and nut shall be Duplex 2205 - vender to confirm	
26	Main drive shaft (single piece from coupling to impeller) material Duplex S32205/S31803 or vender to confirm	
27	Shaft sleeve at mechnaical mechanical seal portion shall be CD4MCu ASTM A 743 or better material - vender to confirm	
28	Key material for impeller mounting minimum SS 316- vender to confirm	
29	Name plate shall be in SS 304 - vender to confirm	
30	Rotation arrow to be cast in the body or arrow plate with SS304 to be fixed on the pump - vender to confirm	
31	Direct Drive flexible coupling with high tensile bolts is to be provided by vendor (belt drive not acceptable). Coupling make and model Number Coupling drawing with BOM to be provided after purchase order. Vendor to confirm	
32	Coupling guards with mounting bolt(SS304) to be provided	
33	Mechanical seal life minimum 25,000 hrs Vendor to confirm	
34	Mechanical drawing with complete BOM to be provided after purchase order.	
35	Temporary conical strainer to be provided - vender to confirm	
36	Mechanical seal flushing provision to be provided (If applicable) by vendor at inlet/outlet with G 1/4 pipe connection -vender to confrim	
37	Fushing water Quantity , qaulity & pressure will be inforemed by the vendor	
38	pump shaft power for each pump to be provided	
39	safety factor 1.1 minimum required vender to confirm	
40	Motor efficiency class (minium IE3)	
41	Guranteed power consumption in KW (Backup calculation for power consumption to be provided)	
42	Motor rating to be furnished for all motor along with backup calculation	
43	At pump Inlet & outlet non metallic Expansion joint with flang and fasteners to be provided	
44	Drain pipe with valve to be provided at the bottom of casing- vender to confirm	
45	First fill oil /grease other consumable to be sent along with pump - vender to confirm	
46	Painting : 1).Red Oxide Zinc Phosphate Primer - (Two coats 60 +60 µ). 2).One coat of Synthetic Enamel intermediate (50µ) 3).Synthetic Enamel to IS 2932, (two coat 50+50µ) colour:Light blue RAL 5012- total DFT 210µ	
47	Performance test - if test flow medium is water , then density of slurry is to be considered while arriving final values vlaues of head,flow and power consumption - vender to confirm	

SLNO	PARAMETERS/TECHNICAL INFORMATION OF SLURRY AND PUMP DATA SHEET for Filtrate Water Tank Pump	Bidder's Conformation
1	Pump & Motor shall be designed with discharge valve fully open & close conditions - Vendor to confirm	
2	pump model offered to be mentioned by vendor	
3	NPSHr to be indicated by vendor	
4	Pump performance curves Flow v/s Head , ii. Flow v/s NPSH iii. Flow v/s Efficiency, iv. Flow v/s power, (v) Flow vs NPSHr - are to be submitted along with offer by vendor for evaluating the Bid	
5	General Arrangement drawings with material of construction, important dimensions- to be submitted along with offer by vendor for evaluating the Bid	
6	All mounting bolts and foundation bolts are made up of minimum SS 304 (vendor scope & vendor to confirm)	
7	Inlet and outlet dia of pump	
8	Impeller diameter	
9	Tip speed vendor to specify (less than 30m/s)	
10	GD ² at drive end of the shaft to furnished	
11	All bearing of pump and motor are FAG/SKF only vendor to confirm	
12	Bearing cooling air /oil/water - if any required vendor to specify	
13	Pump efficiency (minimum expected 65% for horizontal pumps and min 45% for vertical pumps) Vendor to specify	
14	Rated RPM of the pump - should not exceed 1500RPM (vendor to confirm)	
15	The operating speed shall be atleast 20% higher than first critical speed - and Second speed should be 130 % higher than operating speed vendor to confirm	
16	The operating range of the pump shall be 40% to 120% of the duty point - vendor to confirm	
17	The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the duty point flow	
18	Shut-off head is minimum 15% higher than the duty point head- vendor to confirm	
19	Common base plate to be provided by vendor A/29/A36 /A283/IS2062 or equivalent international standard	
20	Vibration pad required (between base plate and pump & motor) vendor to provide & confirm	
21	Pump casing ,Wear plate and cover cover plate and all slurry wetted part shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. Also, bidder can offer high chrome alloy lined pump (ASTM 532 Grade IIIA (30Cr) with minimum hardness 600-650 BHN or better material) if bidder has previous experience. Bidder to confirm.	
22	The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement.Bidder to confirm.	
23	All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hours.Bidder to confirm.	

24	Impeller high chrome alloy ASTM 532 Grade IIIA (30Cr)with minimum hardness 600-650 BHN- vendor to confirm	
25	Impeller mounting bolt and nut shall be Duplex 2205 - vendor to confirm	
26	Main drive shaft (single piece from coupling to impeller) material Duplex S32205/S31803 or vendor to confirm	
27	Shaft sleeve at mechnaical mechanical seal portion shall be CD4MCu ASTM A 743 or better material - vendor to confirm	
28	Key material for impeller mounting minimum SS 316- vendor to confirm	
29	Name plate shall be in SS 304 - vendor to confirm	
30	Rotation arrow to be cast in the body or arrow plate with SS304 to be fixed on the pump - vendor to confirm	
31	Direct Drive flexible coupling with high tensile bolts is to be provided by vendor (belt drive not acceptable). Coupling make and model Number Coupling drawing with BOM to be provided after purchase order. Vendor to confirm	
32	Coupling guards with mounting bolt(SS304) to be provided	
33	Mechanical seal life minimum 25,000 hrs Vendor to confirm	
34	Mechanical drawing with complete BOM to be provided after purchase order.	
35	Temporary conical strainer to be provided - vendor to confirm	
36	Mechanical seal flushing provision to be provided (If applicable) by vendor at inlet/outlet with G 1/4 pipe connection -vendor to confrim	
37	Fushing water Quantity , qaulity & pressure will be inforemed by the vendor	
38	pump shaft power for each pump to be provided	
39	safety factor 1.1 minimum required vendor to confirm	
40	Motor efficiency class (minium IE3)	
41	Guranteed power consumption in KW (Backup calculation for power consumption to be provided)	
42	Motor rating to be furnished for all motor along with backup calculation	
43	At pump Inlet & outlet non metallic Expansion joint with flang and fasteners to be provided	
44	Drain pipe with valve to be provided at the bottom of casing- vendor to confirm	
45	First fill oil /grease other consumable to be sent along with pump - vendor to confirm	
46	Painting : 1).Red Oxide Zinc Phosphate Primer - (Two coats 60 +60 μ). 2).One coat of Synthetic Enamel intermediate (50μ) 3).Synthetic Enamel to IS 2932, (two coat 50+50μ) colour:Light blue RAL 5012- total DFT 210μ	
47	Performance test - if test flow medium is water , then density of slurry is to be considered while arriving final values vlaues of head,flow and power consumption - vendor to confirm	

SLNO	PARAMETERS/TECHNICAL INFORMATION OF SLURRY AND PUMP DATA SHEET for Filtrate Water Tank Pump	Bidder's Conformation
1	Pump & Motor shall be designed with discharge valve fully open & close conditions - Vendor to confirm	
2	pump model offered to be mentioned by vendor	
3	NPSHr to be indicated by vendor	
4	Pump performance curves Flow v/s Head , ii. Flow v/s NPSH iii. Flow v/s Efficiency, iv. Flow v/s power, (v) Flow vs NPSHr - are to be submitted along with offer by vendor for evaluating the Bid	
5	General Arrangement drawings with material of construction, important dimensions- to be submitted along with offer by vendor for evaluating the Bid	
6	All mounting bolts and foundation bolts are made up of minimum SS 304 (vendor scope & vendor to confirm)	
7	Inlet and outlet dia of pump	
8	Impeller diameter	
9	Tip speed vendor to specify (less than 30m/s)	
10	GD ² at drive end of the shaft to furnished	
11	All bearing of pump and motor are FAG/SKF only vendor to confirm	
12	Bearing cooling air /oil/water - if any required vendor to specify	
13	Pump efficiency (minimum expected 65% for horizontal pumps and min 45% for vertical pumps) Vendor to specify	
14	Rated RPM of the pump - should not exceed 1500RPM (vendor to confirm)	
15	The operating speed shall be atleast 20% higher than first critical speed - and Second speed should be 130 % higher than operating speed vendor to confirm	
16	The operating range of the pump shall be 40% to 120% of the duty point - vendor to confirm	
17	The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the duty point flow	
18	Shut-off head is minimum 15% higher than the duty point head- vendor to confirm	
19	Common base plate to be provided by vendor A/29/A36 /A283/IS2062 or equivalent international standard	
20	Vibration pad required (between base plate and pump & motor) vendor to provide & confirm	
21	Pump casing ,Wear plate and cover cover plate and all slurry wetted part shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. Also, bidder can offer high chrome alloy lined pump (ASTM 532 Grade IIIA (30Cr) with minimum hardness 600-650 BHN or better material) if bidder has previous experience. Bidder to confirm.	
22	The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement.Bidder to confirm.	

23	All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hours.Bidder to confirm.	
24	Impeller high chrome alloy ASTM 532 Grade IIIA (30Cr)with minimum hardness 600-650 BHN- vendor to confirm	
25	Impeller mounting bolt and nut shall be Duplex 2205 - vendor to confirm	
26	Main drive shaft (single piece from coupling to impeller) material Duplex S32205/S31803 or vendor to confirm	
27	Shaft sleeve at mechnaical mechanical seal portion shall be CD4MCu ASTM A 743 or better material - vendor to confirm	
28	Key material for impeller mounting minimum SS 316- vendor to confirm	
29	Name plate shall be in SS 304 - vendor to confirm	
30	Rotation arrow to be cast in the body or arrow plate with SS304 to be fixed on the pump - vendor to confirm	
31	Direct Drive flexible coupling with high tensile bolts is to be provided by vendor (belt drive not acceptable). Coupling make and model Number Coupling drawing with BOM to be provided after purchase order. Vendor to confirm	
32	Coupling guards with mounting bolt(SS304) to be provided	
33	Mechanical seal life minimum 25,000 hrs Vendor to confirm	
34	Mechanical drawing with complete BOM to be provided after purchase order.	
35	Temporary conical strainer to be provided - vendor to confirm	
36	Mechanical seal flushing provision to be provided (If applicable) by vendor at inlet/outlet with G 1/4 pipe connection -vendor to confrim	
37	Fushing water Quantity , qaulity & pressure will be inforemed by the vendor	
38	pump shaft power for each pump to be provided	
39	safety factor 1.1 minimum required vendor to confirm	
40	Motor efficiency class (minium IE3)	
41	Guranteed power consumption in KW (Backup calculation for power consumption to be provided)	
42	Motor rating to be furnished for all motor along with backup calculation	
43	At pump Inlet & outlet non metallic Expansion joint with flang and fasteners to be provided	
44	Drain pipe with valve to be provided at the bottom of casing- vendor to confirm	
45	First fill oil /grease other consumable to be sent along with pump - vendor to confirm	
46	Painting : 1).Red Oxide Zinc Phosphate Primer - (Two coats 60 +60 μ). 2).One coat of Synthetic Enamel intermediate (50μ) 3).Synthetic Enamel to IS 2932, (two coat 50+50μ) colour:Light blue RAL 5012- total DFT 210μ	

47	Performance test - if test flow medium is water , then density of slurry is to be considered while arriving final values vlaues of head,flow and power consumption - vendor to confirm	
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SLNO	PARAMETERS/TECHNICAL INFORMATION OF SLURRY AND PUMP DATA SHEET for Waste Water Tank Pump	Bidder's Conformation
1	Pump & Motor shall be designed with discharge valve fully open & close conditions - Vendor to confirm	
2	pump model offered to be mentioned by vendor	
3	NPSHr to be indicated by vendor	
4	Pump performance curves Flow v/s Head , ii. Flow v/s NPSH iii. Flow v/s Efficiency, iv. Flow v/s power, (v) Flow vs NPSHr - are to be submitted along with offer by vendor for evaluating the Bid	
5	General Arrangement drawings with material of construction, important dimensions- to be submitted along with offer by vendor for evaluating the Bid	
6	All mounting bolts and foundation bolts are made up of minimum SS 304 (vendor scope & vendor to confirm)	
7	Inlet and outlet dia of pump	
8	Impeller diameter	
9	Tip speed vendor to specify (less than 30m/s)	
10	GD ² at drive end of the shaft to furnished	
11	All bearing of pump and motor are FAG/SKF only vendor to confirm	
12	Bearing cooling air /oil/water - if any required vendor to specify	
13	Pump efficiency (minimum expected 65% for horizontal pumps and min 45% for vertical pumps) Vendor to specify	
14	Rated RPM of the pump - should not exceed 1500RPM (vendor to confirm)	
15	The operating speed shall be atleast 20% higher than first critical speed - and Second speed should be 130 % higher than operating speed vendor to confirm	
16	The operating range of the pump shall be 40% to 120% of the duty point - vendor to confirm	
17	The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the duty point flow	
18	Shut-off head is minimum 15% higher than the duty point head- vendor to confirm	
19	Common base plate to be provided by vendor A/29/A36 /A283/IS2062 or equivalent international standard	
20	Vibration pad required (between base plate and pump & motor) vendor to provide & confirm	
21	Pump casing ,Wear plate and cover cover plate and all slurry wetted part shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. Also, bidder can offer high chrome alloy lined pump (ASTM 532 Grade IIIA (30Cr) with minimum hardness 600-650 BHN or better material) if bidder has previous experience. Bidder to confirm.	

22	The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement.Bidder to confirm.	
23	All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hours.Bidder to confirm.	
24	Impeller high chrome alloy ASTM 532 Grade IIIA (30Cr)with minimum hardness 600-650 BHN- vendor to confirm	
25	Impeller mounting bolt and nut shall be Duplex 2205 - vendor to confirm	
26	Main drive shaft (single piece from coupling to impeller) material Duplex S32205/S31803 or vendor to confirm	
27	Shaft sleeve at mechnaical mechanical seal portion shall be CD4MCu ASTM A 743 or better material - vendor to confirm	
28	Key material for impeller mounting minimum SS 316- vendor to confirm	
29	Name plate shall be in SS 304 - vendor to confirm	
30	Rotation arrow to be cast in the body or arrow plate with SS304 to be fixed on the pump - vendor to confirm	
31	Direct Drive flexible coupling with high tensile bolts is to be provided by vendor (belt drive not acceptable). Coupling make and model Number Coupling drawing with BOM to be provided after purchase order. Vendor to confirm	
32	Coupling guards with mounting bolt(SS304) to be provided	
33	Mechanical seal life minimum 25,000 hrs Vendor to confirm	
34	Mechanical drawing with complete BOM to be provided after purchase order.	
35	Temporary conical strainer to be provided - vendor to confirm	
36	Mechanical seal flushing provision to be provided (If applicable) by vendor at inlet/outlet with G 1/4 pipe connection -vendor to confrim	
37	Fushing water Quantity , qaulity & pressure will be inforemed by the vendor	
38	pump shaft power for each pump to be provided	
39	safety factor 1.1 minimum required vendor to confirm	
40	Motor efficiency class (minium IE3)	
41	Guranteed power consumption in KW (Backup calculation for power consumption to be provided)	
42	Motor rating to be furnished for all motor along with backup calculation	
43	At pump Inlet & outlet non metallic Expansion joint with flang and fasteners to be provided	
44	Drain pipe with valve to be provided at the bottom of casing- vendor to confirm	
45	First fill oil /grease other consumable to be sent along with pump - vendor to confirm	

46	Painting : 1).Red Oxide Zinc Phosphate Primer - (Two coats 60 +60 μ). 2).One coat of Synthetic Enamel intermediate (50μ) 3).Synthetic Enamel to IS 2932, (two coat 50+50μ) colour:Light blue RAL 5012- total DFT 210μ	
47	Performance test - if test flow medium is water , then density of slurry is to be considered while arriving final values vlaues of head,flow and power consumption - vendor to confirm	

SLNO	PARAMETERS/TECHNICAL INFORMATION OF SLURRY AND PUMP DATA SHEET for Limestone Slurry Feed Pump	Bidder's Conformation
1	Pump & Motor shall be designed with discharge valve fully open & close conditions - Vendor to confirm	
2	pump model offered to be mentioned by vendor	
3	NPSHr to be indicated by vendor	
4	Pump performance curves Flow v/s Head , ii. Flow v/s NPSH iii. Flow v/s Efficiency, iv. Flow v/s power, (v) Flow vs NPSHr - are to be submitted along with offer by vendor for evaluating the Bid	
5	General Arrangement drawings with material of construction, important dimensions- to be submitted along with offer by vendor for evaluating the Bid	
6	All mounting bolts and foundation bolts are made up of minimum SS 304 (vendor scope & vendor to confirm)	
7	Inlet and outlet dia of pump	
8	Impeller diameter	
9	Tip speed vendor to specify (less than 30m/s)	
10	GD ² at drive end of the shaft to furnished	
11	All bearing of pump and motor are FAG/SKF only vendor to confirm	
12	Bearing cooling air /oil/water - if any required vendor to specify	
13	Pump efficiency (minimum expected 65% for horizontal pumps and min 45% for vertical pumps) Vendor to specify	
14	Rated RPM of the pump - should not exceed 1500RPM (vendor to confirm)	
15	The operating speed shall be atleast 20% higher than first critical speed - and Second speed should be 130 % higher than operating speed vendor to confirm	
16	The operating range of the pump shall be 40% to 120% of the duty point - vendor to confirm	
17	The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the duty point flow	
18	Shut-off head is minimum 15% higher than the duty point head- vendor to confirm	
19	Common base plate to be provided by vendor A/29/A36 /A283/IS2062 or equivalent international standard	
20	Vibration pad required (between base plate and pump & motor) vendor to provide & confirm	
21	Pump casing ,Wear plate and cover cover plate and all slurry wetted part shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. Also, bidder can offer high chrome alloy lined pump (ASTM 532 Grade IIIA (30Cr) with minimum hardness 600-650 BHN or better material) if bidder has previous experience. Bidder to confirm.	

22	The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement.Bidder to confirm.	
23	All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hours.Bidder to confirm.	
24	Impeller high chrome alloy ASTM 532 Grade IIIA (30Cr)with minimum hardness 600-650 BHN- vendor to confirm	
25	Impeller mounting bolt and nut shall be Duplex 2205 - vendor to confirm	
26	Main drive shaft (single piece from coupling to impeller) material Duplex S32205/S31803 or vendor to confirm	
27	Shaft sleeve at mechnaical mechanical seal portion shall be CD4MCu ASTM A 743 or better material - vendor to confirm	
28	Key material for impeller mounting minimum SS 316- vendor to confirm	
29	Name plate shall be in SS 304 - vendor to confirm	
30	Rotation arrow to be cast in the body or arrow plate with SS304 to be fixed on the pump - vendor to confirm	
31	Direct Drive flexible coupling with high tensile bolts is to be provided by vendor (belt drive not acceptable). Coupling make and model Number Coupling drawing with BOM to be provided after purchase order. Vendor to confirm	
32	Coupling guards with mounting bolt(SS304) to be provided	
33	Mechanical seal life minimum 25,000 hrs Vendor to confirm	
34	Mechanical drawing with complete BOM to be provided after purchase order.	
35	Temporary conical strainer to be provided - vendor to confirm	
36	Mechanical seal flushing provision to be provided (If applicable) by vendor at inlet/outlet with G 1/4 pipe connection -vendor to confrim	
37	Fushing water Quantity , qaulity & pressure will be inforemed by the vendor	
38	pump shaft power for each pump to be provided	
39	safety factor 1.1 minimum required vendor to confirm	
40	Motor efficiency class (minium IE3)	
41	Guranteed power consumption in KW (Backup calculation for power consumption to be provided)	
42	Motor rating to be furnished for all motor along with backup calculation	
43	At pump Inlet & outlet non metallic Expansion joint with flang and fasteners to be provided	
44	Drain pipe with valve to be provided at the bottom of casing- vendor to confirm	
45	First fill oil /grease other consumable to be sent along with pump - vendor to confirm	

46	Painting : 1).Red Oxide Zinc Phosphate Primer - (Two coats 60 +60 μ). 2).One coat of Synthetic Enamel intermediate (50μ) 3).Synthetic Enamel to IS 2932, (two coat 50+50μ) colour:Light blue RAL 5012- total DFT 210μ	
47	Performance test - if test flow medium is water , then density of slurry is to be considered while arriving final values vlaues of head,flow and power consumption - vendor to confirm	

SLNO	PARAMETERS/TECHNICAL INFORMATION OF SLURRY AND PUMP DATA SHEET for Auxiliary Absorbent Tank Pump	Bidder's Conformation
1	Pump & Motor shall be designed with discharge valve fully open & close conditions - Vendor to confirm	
2	pump model offered to be mentioned by vendor	
3	NPSHr to be indicated by vendor	
4	Pump performance curves Flow v/s Head , ii. Flow v/s NPSH iii. Flow v/s Efficiency, iv. Flow v/s power, (v) Flow vs NPSHr - are to be submitted along with offer by vendor for evaluating the Bid	
5	General Arrangement drawings with material of construction, important dimensions- to be submitted along with offer by vendor for evaluating the Bid	
6	All mounting bolts and foundation bolts are made up of minimum SS 304 (vendor scope & vendor to confirm)	
7	Inlet and outlet dia of pump	
8	Impeller diameter	
9	Tip speed vendor to specify (less than 30m/s)	
10	GD ² at drive end of the shaft to furnished	
11	All bearing of pump and motor are FAG/SKF only vendor to confirm	
12	Bearing cooling air /oil/water - if any required vendor to specify	
13	Pump efficiency (minimum expected 65% for horizontal pumps and min 45% for vertical pumps) Vendor to specify	
14	Rated RPM of the pump - should not exceed 1500RPM (vendor to confirm)	
15	The operating speed shall be atleast 20% higher than first critical speed - and Second speed should be 130 % higher than operating speed vendor to confirm	
16	The operating range of the pump shall be 40% to 120% of the duty point - vendor to confirm	
17	The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the duty point flow	
18	Shut-off head is minimum 15% higher than the duty point head- vendor to confirm	
19	Common base plate to be provided by vendor A/29/A36 /A283/IS2062 or equivalent international standard	
20	Vibration pad required (between base plate and pump & motor) vendor to provide & confirm	
21	Pump casing ,Wear plate and cover cover plate and all slurry wetted part shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. Also, bidder can offer high chrome alloy lined pump (ASTM 532 Grade IIIA (30Cr) with minimum hardness 600-650 BHN or better material) if bidder has previous experience. Bidder to confirm.	

22	The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement.Bidder to confirm.	
23	All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hours.Bidder to confirm.	
24	Impeller high chrome alloy ASTM 532 Grade IIIA (30Cr)with minimum hardness 600-650 BHN- vendor to confirm	
25	Impeller mounting bolt and nut shall be Duplex 2205 - vendor to confirm	
26	Main drive shaft (single piece from coupling to impeller) material Duplex S32205/S31803 or vendor to confirm	
27	Shaft sleeve at mechnaical mechanical seal portion shall be CD4MCu ASTM A 743 or better material - vendor to confirm	
28	Key material for impeller mounting minimum SS 316- vendor to confirm	
29	Name plate shall be in SS 304 - vendor to confirm	
30	Rotation arrow to be cast in the body or arrow plate with SS304 to be fixed on the pump - vendor to confirm	
31	Direct Drive flexible coupling with high tensile bolts is to be provided by vendor (belt drive not acceptable). Coupling make and model Number Coupling drawing with BOM to be provided after purchase order. Vendor to confirm	
32	Coupling guards with mounting bolt(SS304) to be provided	
33	Mechanical seal life minimum 25,000 hrs Vendor to confirm	
34	Mechanical drawing with complete BOM to be provided after purchase order.	
35	Temporary conical strainer to be provided - vendor to confirm	
36	Mechanical seal flushing provision to be provided (If applicable) by vendor at inlet/outlet with G 1/4 pipe connection -vendor to confrim	
37	Fushing water Quantity , qaulity & pressure will be inforemed by the vendor	
38	pump shaft power for each pump to be provided	
39	safety factor 1.1 minimum required vendor to confirm	
40	Motor efficiency class (minium IE3)	
41	Guranteed power consumption in KW (Backup calculation for power consumption to be provided)	
42	Motor rating to be furnished for all motor along with backup calculation	
43	At pump Inlet & outlet non metallic Expansion joint with flang and fasteners to be provided	
44	Drain pipe with valve to be provided at the bottom of casing- vendor to confirm	
45	First fill oil /grease other consumable to be sent along with pump - vendor to confirm	

46	Painting : 1).Red Oxide Zinc Phosphate Primer - (Two coats 60 +60 μ). 2).One coat of Synthetic Enamel intermediate (50μ) 3).Synthetic Enamel to IS 2932, (two coat 50+50μ) colour:Light blue RAL 5012- total DFT 210μ	
47	Performance test - if test flow medium is water , then density of slurry is to be considered while arriving final values vlaues of head,flow and power consumption - vendor to confirm	

SLNO	PARAMETERS/TECHNICAL INFORMATION OF SLURRY AND PUMP DATA SHEET for Primary hydrocyclone feed tank pump	Bidder's Conformation
1	Pump & Motor shall be designed with discharge valve fully open & close conditions - Vendor to confirm	
2	pump model offered to be mentioned by vendor	
3	NPSHr to be indicated by vendor	
4	Pump performance curves Flow v/s Head , ii. Flow v/s NPSH iii. Flow v/s Efficiency, iv. Flow v/s power, (v) Flow vs NPSHr - are to be submitted along with offer by vendor for evaluating the Bid	
5	General Arrangement drawings with material of construction, important dimensions- to be submitted along with offer by vendor for evaluating the Bid	
6	All mounting bolts and foundation bolts are made up of minimum SS 304 (vendor scope & vendor to confirm)	
7	Inlet and outlet dia of pump	
8	Impeller diameter	
9	Tip speed vendor to specify (less than 30m/s)	
10	GD ² at drive end of the shaft to furnished	
11	All bearing of pump and motor are FAG/SKF only vendor to confirm	
12	Bearing cooling air /oil/water - if any required vendor to specify	
13	Pump efficiency (minimum expected 65% for horizontal pumps and min 45% for vertical pumps) Vendor to specify	
14	Rated RPM of the pump - should not exceed 1500RPM (vendor to confirm)	
15	The operating speed shall be atleast 20% higher than first critical speed - and Second speed should be 130 % higher than operating speed vendor to confirm	
16	The operating range of the pump shall be 40% to 120% of the duty point - vendor to confirm	
17	The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the duty point flow	
18	Shut-off head is minimum 15% higher than the duty point head- vendor to confirm	
19	Common base plate to be provided by vendor A/29/A36 /A283/IS2062 or equivalent international standard	
20	Vibration pad required (between base plate and pump & motor) vendor to provide & confirm	
21	Pump casing ,Wear plate and cover cover plate and all slurry wetted part shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. Also, bidder can offer high chrome alloy lined pump (ASTM 532 Grade IIIA (30Cr) with minimum hardness 600-650 BHN or better material) if bidder has previous experience. Bidder to confirm.	

22	The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement.Bidder to confirm.	
23	All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hours.Bidder to confirm.	
24	Impeller high chrome alloy ASTM 532 Grade IIIA (30Cr)with minimum hardness 600-650 BHN- vendor to confirm	
25	Impeller mounting bolt and nut shall be Duplex 2205 - vendor to confirm	
26	Main drive shaft (single piece from coupling to impeller) material Duplex S32205/S31803 or vendor to confirm	
27	Shaft sleeve at mechnaical mechanical seal portion shall be CD4MCu ASTM A 743 or better material - vendor to confirm	
28	Key material for impeller mounting minimum SS 316- vendor to confirm	
29	Name plate shall be in SS 304 - vendor to confirm	
30	Rotation arrow to be cast in the body or arrow plate with SS304 to be fixed on the pump - vendor to confirm	
31	Direct Drive flexible coupling with high tensile bolts is to be provided by vendor (belt drive not acceptable). Coupling make and model Number Coupling drawing with BOM to be provided after purchase order. Vendor to confirm	
32	Coupling guards with mounting bolt(SS304) to be provided	
33	Mechanical seal life minimum 25,000 hrs Vendor to confirm	
34	Mechanical drawing with complete BOM to be provided after purchase order.	
35	Temporary conical strainer to be provided - vendor to confirm	
36	Mechanical seal flushing provision to be provided (If applicable) by vendor at inlet/outlet with G 1/4 pipe connection -vendor to confrim	
37	Fushing water Quantity , qaulity & pressure will be inforemed by the vendor	
38	pump shaft power for each pump to be provided	
39	safety factor 1.1 minimum required vendor to confirm	
40	Motor efficiency class (minium IE3)	
41	Guranteed power consumption in KW (Backup calculation for power consumption to be provided)	
42	Motor rating to be furnished for all motor along with backup calculation	
43	At pump Inlet & outlet non metallic Expansion joint with flang and fasteners to be provided	
44	Drain pipe with valve to be provided at the bottom of casing- vendor to confirm	
45	First fill oil /grease other consumable to be sent along with pump - vendor to confirm	

46	Painting : 1).Red Oxide Zinc Phosphate Primer - (Two coats 60 +60 μ). 2).One coat of Synthetic Enamel intermediate (50μ) 3).Synthetic Enamel to IS 2932, (two coat 50+50μ) colour:Light blue RAL 5012- total DFT 210μ	
47	Performance test - if test flow medium is water , then density of slurry is to be considered while arriving final values vlaues of head,flow and power consumption - vendor to confirm	

SLNO	PARAMETERS/TECHNICAL INFORMATION OF SLURRY AND PUMP DATA SHEET for Absorber area drain sump pump	Bidder's Conformation
1	Pump & Motor shall be designed with discharge valve fully open & close conditions - Vendor to confirm	
2	pump model offered to be mentioned by vendor	
3	NPSHr to be indicated by vendor	
4	Pump performance curves Flow v/s Head , ii. Flow v/s NPSH iii. Flow v/s Efficiency, iv. Flow v/s power, (v) Flow vs NPSHr - are to be submitted along with offer by vendor for evaluating the Bid	
5	General Arrangement drawings with material of construction, important dimensions- to be submitted along with offer by vendor for evaluating the Bid	
6	All mounting bolts and foundation bolts are made up of minimum SS 304 (vendor scope & vendor to confirm)	
7	Inlet and outlet dia of pump	
8	Impeller diameter	
9	Tip speed vendor to specify (less than 30m/s)	
10	GD ² at drive end of the shaft to furnished	
11	All bearing of pump and motor are FAG/SKF only vendor to confirm	
12	Bearing cooling air /oil/water - if any required vendor to specify	
13	Pump efficiency (minimum expected 65% for horizontal pumps and min 45% for vertical pumps) Vendor to specify	
14	Rated RPM of the pump - should not exceed 1500RPM (vendor to confirm)	
15	The operating speed shall be atleast 20% higher than first critical speed - and Second speed should be 130 % higher than operating speed vendor to confirm	
16	The operating range of the pump shall be 40% to 120% of the duty point - vendor to confirm	
17	The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the duty point flow	
18	Shut-off head is minimum 15% higher than the duty point head- vendor to confirm	
19	Common base plate to be provided by vendor A/29/A36 /A283/IS2062 or equivalent international standard	
20	Vibration pad required (between base plate and pump & motor) vendor to provide & confirm	
21	Pump casing ,Wear plate and cover cover plate and all slurry wetted part shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. Also, bidder can offer high chrome alloy lined pump (ASTM 532 Grade IIIA (30Cr) with minimum hardness 600-650 BHN or better material) if bidder has previous experience. Bidder to confirm.	

22	The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement.Bidder to confirm.	
23	All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hours.Bidder to confirm.	
24	Impeller high chrome alloy ASTM 532 Grade IIIA (30Cr)with minimum hardness 600-650 BHN- vendor to confirm	
25	Impeller mounting bolt and nut shall be Duplex 2205 - vendor to confirm	
26	Main drive shaft (single piece from coupling to impeller) material Duplex S32205/S31803 or vendor to confirm	
27	Shaft sleeve at mechnaical mechanical seal portion shall be CD4MCu ASTM A 743 or better material - vendor to confirm	
28	Key material for impeller mounting minimum SS 316- vendor to confirm	
29	Name plate shall be in SS 304 - vendor to confirm	
30	Rotation arrow to be cast in the body or arrow plate with SS304 to be fixed on the pump - vendor to confirm	
31	Direct Drive flexible coupling with high tensile bolts is to be provided by vendor (belt drive not acceptable). Coupling make and model Number Coupling drawing with BOM to be provided after purchase order. Vendor to confirm	
32	Coupling guards with mounting bolt(SS304) to be provided	
33	Mechanical seal life minimum 25,000 hrs Vendor to confirm	
34	Mechanical drawing with complete BOM to be provided after purchase order.	
35	Temporary conical strainer to be provided - vendor to confirm	
36	Mechanical seal flushing provision to be provided (If applicable) by vendor at inlet/outlet with G 1/4 pipe connection -vendor to confrim	
37	Fushing water Quantity , qaulity & pressure will be inforemed by the vendor	
38	pump shaft power for each pump to be provided	
39	safety factor 1.1 minimum required vendor to confirm	
40	Motor efficiency class (minium IE3)	
41	Guranteed power consumption in KW (Backup calculation for power consumption to be provided)	
42	Motor rating to be furnished for all motor along with backup calculation	
43	At pump Inlet & outlet non metallic Expansion joint with flang and fasteners to be provided	
44	Drain pipe with valve to be provided at the bottom of casing- vendor to confirm	
45	First fill oil /grease other consumable to be sent along with pump - vendor to confirm	

46	Painting : 1).Red Oxide Zinc Phosphate Primer - (Two coats 60 +60 μ). 2).One coat of Synthetic Enamel intermediate (50μ) 3).Synthetic Enamel to IS 2932, (two coat 50+50μ) colour:Light blue RAL 5012- total DFT 210μ	
47	Performance test - if test flow medium is water , then density of slurry is to be considered while arriving final values vlaues of head,flow and power consumption - vendor to confirm	

SLNO	PARAMETERS/TECHNICAL INFORMATION OF SLURRY AND PUMP DATA SHEET for Gypsum area drain sump pump	Bidder's Conformation
1	Pump & Motor shall be designed with discharge valve fully open & close conditions - Vendor to confirm	
2	pump model offered to be mentioned by vendor	
3	NPSHr to be indicated by vendor	
4	Pump performance curves Flow v/s Head , ii. Flow v/s NPSH iii. Flow v/s Efficiency, iv. Flow v/s power, (v) Flow vs NPSHr - are to be submitted along with offer by vendor for evaluating the Bid	
5	General Arrangement drawings with material of construction, important dimensions- to be submitted along with offer by vendor for evaluating the Bid	
6	All mounting bolts and foundation bolts are made up of minimum SS 304 (vendor scope & vendor to confirm)	
7	Inlet and outlet dia of pump	
8	Impeller diameter	
9	Tip speed vendor to specify (less than 30m/s)	
10	GD ² at drive end of the shaft to furnished	
11	All bearing of pump and motor are FAG/SKF only vendor to confirm	
12	Bearing cooling air /oil/water - if any required vendor to specify	
13	Pump efficiency (minimum expected 65% for horizontal pumps and min 45% for vertical pumps) Vendor to specify	
14	Rated RPM of the pump - should not exceed 1500RPM (vendor to confirm)	
15	The operating speed shall be atleast 20% higher than first critical speed - and Second speed should be 130 % higher than operating speed vendor to confirm	
16	The operating range of the pump shall be 40% to 120% of the duty point - vendor to confirm	
17	The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the duty point flow	
18	Shut-off head is minimum 15% higher than the duty point head- vendor to confirm	
19	Common base plate to be provided by vendor A/29/A36 /A283/IS2062 or equivalent international standard	
20	Vibration pad required (between base plate and pump & motor) vendor to provide & confirm	
21	Pump casing ,Wear plate and cover cover plate and all slurry wetted part shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. Also, bidder can offer high chrome alloy lined pump (ASTM 532 Grade IIIA (30Cr) with minimum hardness 600-650 BHN or better material) if bidder has previous experience. Bidder to confirm.	

22	The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement.Bidder to confirm.	
23	All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hours.Bidder to confirm.	
24	Impeller high chrome alloy ASTM 532 Grade IIIA (30Cr)with minimum hardness 600-650 BHN- vendor to confirm	
25	Impeller mounting bolt and nut shall be Duplex 2205 - vendor to confirm	
26	Main drive shaft (single piece from coupling to impeller) material Duplex S32205/S31803 or vendor to confirm	
27	Shaft sleeve at mechnaical mechanical seal portion shall be CD4MCu ASTM A 743 or better material - vendor to confirm	
28	Key material for impeller mounting minimum SS 316- vendor to confirm	
29	Name plate shall be in SS 304 - vendor to confirm	
30	Rotation arrow to be cast in the body or arrow plate with SS304 to be fixed on the pump - vendor to confirm	
31	Direct Drive flexible coupling with high tensile bolts is to be provided by vendor (belt drive not acceptable). Coupling make and model Number Coupling drawing with BOM to be provided after purchase order. Vendor to confirm	
32	Coupling guards with mounting bolt(SS304) to be provided	
33	Mechanical seal life minimum 25,000 hrs Vendor to confirm	
34	Mechanical drawing with complete BOM to be provided after purchase order.	
35	Temporary conical strainer to be provided - vendor to confirm	
36	Mechanical seal flushing provision to be provided (If applicable) by vendor at inlet/outlet with G 1/4 pipe connection -vendor to confrim	
37	Fushing water Quantity , qaulity & pressure will be inforemed by the vendor	
38	pump shaft power for each pump to be provided	
39	safety factor 1.1 minimum required vendor to confirm	
40	Motor efficiency class (minium IE3)	
41	Guranteed power consumption in KW (Backup calculation for power consumption to be provided)	
42	Motor rating to be furnished for all motor along with backup calculation	
43	At pump Inlet & outlet non metallic Expansion joint with flang and fasteners to be provided	
44	Drain pipe with valve to be provided at the bottom of casing- vendor to confirm	
45	First fill oil /grease other consumable to be sent along with pump - vendor to confirm	

46	Painting : 1).Red Oxide Zinc Phosphate Primer - (Two coats 60 +60 μ). 2).One coat of Synthetic Enamel intermediate (50μ) 3).Synthetic Enamel to IS 2932, (two coat 50+50μ) colour:Light blue RAL 5012- total DFT 210μ	
47	Performance test - if test flow medium is water , then density of slurry is to be considered while arriving final values vlaues of head,flow and power consumption - vendor to confirm	

SLNO	PARAMETERS/TECHNICAL INFORMATION OF SLURRY AND PUMP DATA SHEET for Limestone area drain sump pump	Bidder's Conformation
1	Pump & Motor shall be designed with discharge valve fully open & close conditions - Vendor to confirm	
2	pump model offered to be mentioned by vendor	
3	NPSHr to be indicated by vendor	
4	Pump performance curves Flow v/s Head , ii. Flow v/s NPSH iii. Flow v/s Efficiency, iv. Flow v/s power, (v) Flow vs NPSHr - are to be submitted along with offer by vendor for evaluating the Bid	
5	General Arrangement drawings with material of construction, important dimensions- to be submitted along with offer by vendor for evaluating the Bid	
6	All mounting bolts and foundation bolts are made up of minimum SS 304 (vendor scope & vendor to confirm)	
7	Inlet and outlet dia of pump	
8	Impeller diameter	
9	Tip speed vendor to specify (less than 30m/s)	
10	GD ² at drive end of the shaft to furnished	
11	All bearing of pump and motor are FAG/SKF only vendor to confirm	
12	Bearing cooling air /oil/water - if any required vendor to specify	
13	Pump efficiency (minimum expected 65% for horizontal pumps and min 45% for vertical pumps) Vendor to specify	
14	Rated RPM of the pump - should not exceed 1500RPM (vendor to confirm)	
15	The operating speed shall be atleast 20% higher than first critical speed - and Second speed should be 130 % higher than operating speed vendor to confirm	
16	The operating range of the pump shall be 40% to 120% of the duty point - vendor to confirm	
17	The maximum efficiency of pump shall preferably be within $\pm 10\%$ of the duty point flow	
18	Shut-off head is minimum 15% higher than the duty point head- vendor to confirm	
19	Common base plate to be provided by vendor A/29/A36 /A283/IS2062 or equivalent international standard	
20	Vibration pad required (between base plate and pump & motor) vendor to provide & confirm	
21	Pump casing ,Wear plate and cover cover plate and all slurry wetted part shall be provided with replaceable rubber/elastomer liners suitable for the fluid handled. Also, bidder can offer high chrome alloy lined pump (ASTM 532 Grade IIIA (30Cr) with minimum hardness 600-650 BHN or better material) if bidder has previous experience. Bidder to confirm.	
22	The material and thickness of the liners shall ensure a minimum service life of 2 years before replacement.Bidder to confirm.	

23	All the wear parts of the pump shall be guaranteed for a minimum wear life of not less than 14000 hours.Bidder to confirm.	
24	Impeller high chrome alloy ASTM 532 Grade IIIA (30Cr)with minimum hardness 600-650 BHN- vendor to confirm	
25	Impeller mounting bolt and nut shall be Duplex 2205 - vendor to confirm	
26	Main drive shaft (single piece from coupling to impeller) material Duplex S32205/S31803 or vendor to confirm	
27	Shaft sleeve at mechnaical mechanical seal portion shall be CD4MCu ASTM A 743 or better material - vendor to confirm	
28	Key material for impeller mounting minimum SS 316- vendor to confirm	
29	Name plate shall be in SS 304 - vendor to confirm	
30	Rotation arrow to be cast in the body or arrow plate with SS304 to be fixed on the pump - vendor to confirm	
31	Direct Drive flexible coupling with high tensile bolts is to be provided by vendor (belt drive not acceptable). Coupling make and model Number Coupling drawing with BOM to be provided after purchase order. Vendor to confirm	
32	Coupling guards with mounting bolt(SS304) to be provided	
33	Mechanical seal life minimum 25,000 hrs Vendor to confirm	
34	Mechanical drawing with complete BOM to be provided after purchase order.	
35	Temporary conical strainer to be provided - vendor to confirm	
36	Mechanical seal flushing provision to be provided (If applicable) by vendor at inlet/outlet with G 1/4 pipe connection -vendor to confrim	
37	Fushing water Quantity , qaulity & pressure will be inforemed by the vendor	
38	pump shaft power for each pump to be provided	
39	safety factor 1.1 minimum required vendor to confirm	
40	Motor efficiency class (minium IE3)	
41	Guranteed power consumption in KW (Backup calculation for power consumption to be provided)	
42	Motor rating to be furnished for all motor along with backup calculation	
43	At pump Inlet & outlet non metallic Expansion joint with flang and fasteners to be provided	
44	Drain pipe with valve to be provided at the bottom of casing- vendor to confirm	
45	First fill oil /grease other consumable to be sent along with pump - vendor to confirm	
46	Painting : 1).Red Oxide Zinc Phosphate Primer - (Two coats 60 +60 μ). 2).One coat of Synthetic Enamel intermediate (50μ) 3).Synthetic Enamel to IS 2932, (two coat 50+50μ) colour:Light blue RAL 5012- total DFT 210μ	

47	Performance test - if test flow medium is water , then density of slurry is to be considered while arriving final values vlaues of head,flow and power consumption - vendor to confirm	
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S.No	Parameters	To be confirmed by vendor for	Bidders Conformation
1	Direction of rotation	Suitable for both directions	
2	Class of Insulation	Thermal class 155 (F) insulation	
3	Winding Insulation	The winding insulation process shall be Global Vacuum Pressure Impregnated i.e. resin poor method	
4.1	Starting Current	Less than or equal to 600 % full load current subject to tolerance as per IS (Normal motor)	
4.2	Starting Current	Less than or equal to 700 % full load current subject to tolerance as per IS (Normal motor)	
5.1	Starting Voltage	Up to 85% of rated voltage for ratings below 110 KW	
5.2	Starting Voltage	Up to 80% of rated voltage for ratings from 110 KW to 200 KW	
6.1	Torque requirement	Accelerating torque at any speed with the lowest permissible starting voltage shall be at least 10% motor full load torque.	
6.2	Torque requirement	Pull out torque at rated voltage shall not be less than 205% of full load torque. It shall be 275% for crane duty motors.	
7.1	Type of enclosure	Motors shall be either Totally enclosed fan cooled (TEFC) or totally enclosed tube ventilated (TETV) or Closed air circuit air cooled (CACA) type.	
7.2	Type of enclosure	VFD driven motors to be offered with forced cooling type with machine mounted fan or pump driven by separate electric motor.	
8a.	Dimensions of Terminal box for LV motors - MCR -Upto 3Kw	Distance between center of stud & gland plate (in mm): Vendor's Standard	
8b.	Dimensions of Terminal box for LV motors - MCR -Above 3Kw to 7kw	Distance between center of stud & gland plate (in mm): 85	
8c.	Dimensions of Terminal box for LV motors - MCR -Above 7Kw to 13kw	Distance between center of stud & gland plate (in mm): 115	
8d.	Dimensions of Terminal box for LV motors - MCR -Above 13Kw to 24kw	Distance between center of stud & gland plate (in mm): 167	
8e.	Dimensions of Terminal box for LV motors - MCR -Above 24Kw to 37kw	Distance between center of stud & gland plate (in mm): 196	

8f.	Dimensions of Terminal box for LV motors - MCR -Above 37Kw to 55kw	Distance between center of stud & gland plate (in mm): 249	
8g.	Dimensions of Terminal box for LV motors - MCR -Above 55Kw to 90kw	Distance between center of stud & gland plate (in mm): 277	
9	Cable glands & Lugs	Double compression type Nickel plated brass cable gland & insulated tinned copper crimping lugs to suit the cable sizes	
10	Paint shade	RAL 5012 (Blue)	
11.1	Space heaters	Suitable single phase space heaters shall be provided on motors rated 30KW and above.	
11.2	Space heaters	Separate terminal box for space heaters shall be provided	

DE-1	LT MOTORS for Gypsum bleed pump	Bidder Response
A	GENERAL	
1	Manufacturer & Country of origin.	
2	Equipment driven by motor	
3	Motor type	
4	Quantity	
B	DESIGN AND PERFORMANCE DATA	
1	Frame size	
2	Type of duty	
3	Type of enclosure /Method of cooling/ Degree of protection	
4	Applicable standard to which motor generally conforms	
5	Efficiency IE3 of IS 12615(IE3) or above (vendor to fillup efficiency here)	
6a	Whether motor is flame proof	
6b	If yes, the gas group to which it conforms as per IS:2148	
7	Type of mounting	
8	Direction of rotation as viewed from DE END	
9	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11	Maximum continuous load demand of driven equipment in KW	
12	Rated Voltage (volts)	
13a	Voltage (volts)	
13b	Frequency (Hz)	
13c	Combined Voltage and Frequency	
14	Rated speed at rated voltage and frequency (RPM)	
15a	At rated Voltage and frequency: Full load current	
15b	At rated Voltage and frequency: No load current	
16	Power Factor at	
16a	a.100%/75%/50% load	
16b	b. NO load	
16c	c. Starting.	
17	Efficiency at rated voltage and frequency,	
17a	a.100% load	
17b	b. 75% load	
17c	c. 50% load	
18	Starting current (amps) at	
18a	a. 100 % voltage	
18b	b. 85% voltage	
18c	c. 80% voltage	
19	Minimum permissible starting Voltage (Volts)	
20	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
20a	a. Without driven equipment coupled	
20b	b. With driven equipment coupled	

21	Safe stall time with 100% ,110% & 80% of rated voltage	
21a	a. From hot condition	
21b	b. From cold condition	
22	Torques :	
22a	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
22b	b. Pull up torque at rated voltage.	
22c	c. Pull out torque	
22d	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
22e	e.Rated torque (kg.m)	
23	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24	GD2 value of motors	
25	No of permissible successive starts when motor is in hot condition	
26	Locked Rotor KVA Input	
27	Locked Rotor KVA/KW	
28	Vibration limit :Velocity (mm/s)	
29	Noise level limit (dBA)	
C	CONSTRUCTIONAL FEATURES	
1	Stator winding insulation	
1a	a. Class & Type	
1b	b. Winding Insulation Process	
1c	c. Tropicalised (Yes/No)	
1d	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
1e	e. Method of temperature measurement	
1f	f. Stator winding connection	
2	Main Terminal Box	
2a	a. Type	
2b	b. Location(viewed from NDE side)	
2c	c. Entry of cables(bottom/side)	
2d	d. Recommended cable size(To be matched with cable size envisaged by owner)	
2e	e. Fault level (MVA),Fault level duration(sec)	
2f	f. Cable glands & lugs details (shall be suitable for power cable)	
3	Type of DE/NDE Bearing	
4	Motor Paint shade	
5	Weight of	
5a	a. Motor stator (KG)	
5b	b. Motor Rotor (KG)	
5c	c. Total weight (KG)	
D	List of accessories.	
1	Space Heaters (Nos./Power in watts/supply voltage)	
2	Terminal Box for Space Heater (Yes/No)	

3	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4	Insulation of bearing (Yes/No)	
5	Noise reducer(Yes/No)	
6	Grounding pads	
6(i)	i) No and size on motor body	
6(ii)	ii) Nos on terminal Box	
7	Any other fitments	
E	List of curves.(All curves to be attached along with offer.	
1	Torque speed characteristic of the motor (enclosed yes / No)	
2	Thermal withstand characteristic (enclosed yes / No)	
3	Starting. current Vs. Time (enclosed yes / No)	
4	Starting. current Vs speed (enclosed yes / No)	
5	P.F. and Effi. Vs Load (enclosed yes / No)	

DE-1	LT MOTORS for Emergency Transfer Pump	Bidder Response
A	GENERAL	
1	Manufacturer & Country of origin.	
2	Equipment driven by motor	
3	Motor type	
4	Quantity	
B	DESIGN AND PERFORMANCE DATA	
1	Frame size	
2	Type of duty	
3	Type of enclosure /Method of cooling/ Degree of protection	
4	Applicable standard to which motor generally conforms	
5	Efficiency IE3 of IS 12615(IE3) or above (vendor to fillup efficiency here)	
6a	Whether motor is flame proof	
6b	If yes, the gas group to which it conforms as per IS:2148	
7	Type of mounting	
8	Direction of rotation as viewed from DE END	
9	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11	Maximum continuous load demand of driven equipment in KW	
12	Rated Voltage (volts)	
13a	Voltage (volts)	
13b	Frequency (Hz)	
13c	Combined Voltage and Frequency	
14	Rated speed at rated voltage and frequency (RPM)	
15a	At rated Voltage and frequency: Full load current	
15b	At rated Voltage and frequency: No load current	
16	Power Factor at	
16a	a.100%/75%/50% load	
16b	b. NO load	
16c	c. Starting.	
17	Efficiency at rated voltage and frequency,	
17a	a.100% load	
17b	b. 75% load	
17c	c. 50% load	
18	Starting current (amps) at	
18a	a. 100 % voltage	
18b	b. 85% voltage	
18c	c. 80% voltage	
19	Minimum permissible starting Voltage (Volts)	
20	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
20a	a. Without driven equipment coupled	
20b	b. With driven equipment coupled	

21	Safe stall time with 100% ,110% & 80% of rated voltage	
21a	a. From hot condition	
21b	b. From cold condition	
22	Torques :	
22a	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
22b	b. Pull up torque at rated voltage.	
22c	c. Pull out torque	
22d	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
22e	e.Rated torque (kg.m)	
23	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24	GD2 value of motors	
25	No of permissible successive starts when motor is in hot condition	
26	Locked Rotor KVA Input	
27	Locked Rotor KVA/KW	
28	Vibration limit :Velocity (mm/s)	
29	Noise level limit (dBA)	
C	CONSTRUCTIONAL FEATURES	
1	Stator winding insulation	
1a	a. Class & Type	
1b	b. Winding Insulation Process	
1c	c. Tropicalised (Yes/No)	
1d	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
1e	e. Method of temperature measurement	
1f	f. Stator winding connection	
2	Main Terminal Box	
2a	a. Type	
2b	b. Location(viewed from NDE side)	
2c	c. Entry of cables(bottom/side)	
2d	d. Recommended cable size(To be matched with cable size envisaged by owner)	
2e	e. Fault level (MVA),Fault level duration(sec)	
2f	f. Cable glands & lugs details (shall be suitable for power cable)	
3	Type of DE/NDE Bearing	
4	Motor Paint shade	
5	Weight of	
5a	a. Motor stator (KG)	
5b	b. Motor Rotor (KG)	
5c	c. Total weight (KG)	
D	List of accessories.	
1	Space Heaters (Nos./Power in watts/supply voltage)	
2	Terminal Box for Space Heater (Yes/No)	

3	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4	Insulation of bearing (Yes/No)	
5	Noise reducer(Yes/No)	
6	Grounding pads	
6(i)	i) No and size on motor body	
6(ii)	ii) Nos on terminal Box	
7	Any other fitments	
E	List of curves.(All curves to be attached along with offer.	
1	Torque speed characteristic of the motor (enclosed yes / No)	
2	Thermal withstand characteristic (enclosed yes / No)	
3	Starting. current Vs. Time (enclosed yes / No)	
4	Starting. current Vs speed (enclosed yes / No)	
5	P.F. and Effi. Vs Load (enclosed yes / No)	

DE-1	LT MOTORS for Filtrate Water Tank Pump	Bidder Response
A	GENERAL	
1	Manufacturer & Country of origin.	
2	Equipment driven by motor	
3	Motor type	
4	Quantity	
B	DESIGN AND PERFORMANCE DATA	
1	Frame size	
2	Type of duty	
3	Type of enclosure /Method of cooling/ Degree of protection	
4	Applicable standard to which motor generally conforms	
5	Efficiency IE3 of IS 12615(IE3) or above (vendor to fillup efficiency here)	
6a	Whether motor is flame proof	
6b	If yes, the gas group to which it conforms as per IS:2148	
7	Type of mounting	
8	Direction of rotation as viewed from DE END	
9	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11	Maximum continuous load demand of driven equipment in KW	
12	Rated Voltage (volts)	
13a	Voltage (volts)	
13b	Frequency (Hz)	
13c	Combined Voltage and Frequency	
14	Rated speed at rated voltage and frequency (RPM)	
15a	At rated Voltage and frequency: Full load current	
15b	At rated Voltage and frequency: No load current	
16	Power Factor at	
16a	a.100%/75%/50% load	
16b	b. NO load	
16c	c. Starting.	
17	Efficiency at rated voltage and frequency,	
17a	a.100% load	
17b	b. 75% load	
17c	c. 50% load	
18	Starting current (amps) at	
18a	a. 100 % voltage	
18b	b. 85% voltage	
18c	c. 80% voltage	
19	Minimum permissible starting Voltage (Volts)	
20	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
20a	a. Without driven equipment coupled	
20b	b. With driven equipment coupled	

21	Safe stall time with 100% ,110% & 80% of rated voltage	
21a	a. From hot condition	
21b	b. From cold condition	
22	Torques :	
22a	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
22b	b. Pull up torque at rated voltage.	
22c	c. Pull out torque	
22d	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
22e	e.Rated torque (kg.m)	
23	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24	GD2 value of motors	
25	No of permissible successive starts when motor is in hot condition	
26	Locked Rotor KVA Input	
27	Locked Rotor KVA/KW	
28	Vibration limit :Velocity (mm/s)	
29	Noise level limit (dBA)	
C	CONSTRUCTIONAL FEATURES	
1	Stator winding insulation	
1a	a. Class & Type	
1b	b. Winding Insulation Process	
1c	c. Tropicalised (Yes/No)	
1d	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
1e	e. Method of temperature measurement	
1f	f. Stator winding connection	
2	Main Terminal Box	
2a	a. Type	
2b	b. Location(viewed from NDE side)	
2c	c. Entry of cables(bottom/side)	
2d	d. Recommended cable size(To be matched with cable size envisaged by owner)	
2e	e. Fault level (MVA),Fault level duration(sec)	
2f	f. Cable glands & lugs details (shall be suitable for power cable)	
3	Type of DE/NDE Bearing	
4	Motor Paint shade	
5	Weight of	
5a	a. Motor stator (KG)	
5b	b. Motor Rotor (KG)	
5c	c. Total weight (KG)	
D	List of accessories.	
1	Space Heaters (Nos./Power in watts/supply voltage)	
2	Terminal Box for Space Heater (Yes/No)	

3	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4	Insulation of bearing (Yes/No)	
5	Noise reducer(Yes/No)	
6	Grounding pads	
6(i)	i) No and size on motor body	
6(ii)	ii) Nos on terminal Box	
7	Any other fitments	
E	List of curves.(All curves to be attached along with offer.	
1	Torque speed characteristic of the motor (enclosed yes / No)	
2	Thermal withstand characteristic (enclosed yes / No)	
3	Starting. current Vs. Time (enclosed yes / No)	
4	Starting. current Vs speed (enclosed yes / No)	
5	P.F. and Effi. Vs Load (enclosed yes / No)	

DE-1	LT MOTORS for Secondary Hydrocyclone Feed Tank Pump	Bidder Response
A	GENERAL	
1	Manufacturer & Country of origin.	
2	Equipment driven by motor	
3	Motor type	
4	Quantity	
B	DESIGN AND PERFORMANCE DATA	
1	Frame size	
2	Type of duty	
3	Type of enclosure /Method of cooling/ Degree of protection	
4	Applicable standard to which motor generally conforms	
5	Efficiency IE3 of IS 12615(IE3) or above (vendor to fillup efficiency here)	
6a	Whether motor is flame proof	
6b	If yes, the gas group to which it conforms as per IS:2148	
7	Type of mounting	
8	Direction of rotation as viewed from DE END	
9	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11	Maximum continuous load demand of driven equipment in KW	
12	Rated Voltage (volts)	
13a	Voltage (volts)	
13b	Frequency (Hz)	
13c	Combined Voltage and Frequency	
14	Rated speed at rated voltage and frequency (RPM)	
15a	At rated Voltage and frequency: Full load current	
15b	At rated Voltage and frequency: No load current	
16	Power Factor at	
16a	a.100%/75%/50% load	
16b	b. NO load	
16c	c. Starting.	
17	Efficiency at rated voltage and frequency,	
17a	a.100% load	
17b	b. 75% load	
17c	c. 50% load	
18	Starting current (amps) at	
18a	a. 100 % voltage	
18b	b. 85% voltage	
18c	c. 80% voltage	
19	Minimum permissible starting Voltage (Volts)	
20	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
20a	a. Without driven equipment coupled	

20b	b. With driven equipment coupled	
21	Safe stall time with 100% ,110% & 80% of rated voltage	
21a	a. From hot condition	
21b	b. From cold condition	
22	Torques :	
22a	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
22b	b. Pull up torque at rated voltage.	
22c	c. Pull out torque	
22d	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
22e	e. Rated torque (kg.m)	
23	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24	GD2 value of motors	
25	No of permissible successive starts when motor is in hot condition	
26	Locked Rotor KVA Input	
27	Locked Rotor KVA/KW	
28	Vibration limit :Velocity (mm/s)	
29	Noise level limit (dBA)	
C	CONSTRUCTIONAL FEATURES	
1	Stator winding insulation	
1a	a. Class & Type	
1b	b. Winding Insulation Process	
1c	c. Tropicalised (Yes/No)	
1d	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
1e	e. Method of temperature measurement	
1f	f. Stator winding connection	
2	Main Terminal Box	
2a	a. Type	
2b	b. Location(viewed from NDE side)	
2c	c. Entry of cables(bottom/side)	
2d	d. Recommended cable size(To be matched with cable size envisaged by owner)	
2e	e. Fault level (MVA),Fault level duration(sec)	
2f	f. Cable glands & lugs details (shall be suitable for power cable)	
3	Type of DE/NDE Bearing	
4	Motor Paint shade	
5	Weight of	
5a	a. Motor stator (KG)	
5b	b. Motor Rotor (KG)	
5c	c. Total weight (KG)	
D	List of accessories.	
1	Space Heaters (Nos./Power in watts/supply voltage)	

2	Terminal Box for Space Heater (Yes/No)	
3	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4	Insulation of bearing (Yes/No)	
5	Noise reducer(Yes/No)	
6	Grounding pads	
6(i)	i) No and size on motor body	
6(ii)	ii) Nos on terminal Box	
7	Any other fitments	
E	List of curves.(All curves to be attached along with offer.	
1	Torque speed characteristic of the motor (enclosed yes / No)	
2	Thermal withstand characteristic (enclosed yes / No)	
3	Starting. current Vs. Time (enclosed yes / No)	
4	Starting. current Vs speed (enclosed yes / No)	
5	P.F. and Effi. Vs Load (enclosed yes / No)	

DE-1	LT MOTORS for Waste Water Tank Pump	Bidder Response
A	GENERAL	
1	Manufacturer & Country of origin.	
2	Equipment driven by motor	
3	Motor type	
4	Quantity	
B	DESIGN AND PERFORMANCE DATA	
1	Frame size	
2	Type of duty	
3	Type of enclosure /Method of cooling/ Degree of protection	
4	Applicable standard to which motor generally conforms	
5	Efficiency IE3 of IS 12615(IE3) or above (vendor to fillup efficiency here)	
6a	Whether motor is flame proof	
6b	If yes, the gas group to which it conforms as per IS:2148	
7	Type of mounting	
8	Direction of rotation as viewed from DE END	
9	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11	Maximum continuous load demand of driven equipment in KW	
12	Rated Voltage (volts)	
13a	Voltage (volts)	
13b	Frequency (Hz)	
13c	Combined Voltage and Frequency	
14	Rated speed at rated voltage and frequency (RPM)	
15a	At rated Voltage and frequency: Full load current	
15b	At rated Voltage and frequency: No load current	
16	Power Factor at	
16a	a.100%/75%/50% load	
16b	b. NO load	
16c	c. Starting.	
17	Efficiency at rated voltage and frequency,	
17a	a.100% load	
17b	b. 75% load	
17c	c. 50% load	
18	Starting current (amps) at	
18a	a. 100 % voltage	
18b	b. 85% voltage	
18c	c. 80% voltage	
19	Minimum permissible starting Voltage (Volts)	
20	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
20a	a. Without driven equipment coupled	
20b	b. With driven equipment coupled	

21	Safe stall time with 100% ,110% & 80% of rated voltage	
21a	a. From hot condition	
21b	b. From cold condition	
22	Torques :	
22a	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
22b	b. Pull up torque at rated voltage.	
22c	c. Pull out torque	
22d	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
22e	e.Rated torque (kg.m)	
23	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24	GD2 value of motors	
25	No of permissible successive starts when motor is in hot condition	
26	Locked Rotor KVA Input	
27	Locked Rotor KVA/KW	
28	Vibration limit :Velocity (mm/s)	
29	Noise level limit (dBA)	
C	CONSTRUCTIONAL FEATURES	
1	Stator winding insulation	
1a	a. Class & Type	
1b	b. Winding Insulation Process	
1c	c. Tropicalised (Yes/No)	
1d	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
1e	e. Method of temperature measurement	
1f	f. Stator winding connection	
2	Main Terminal Box	
2a	a. Type	
2b	b. Location(viewed from NDE side)	
2c	c. Entry of cables(bottom/side)	
2d	d. Recommended cable size(To be matched with cable size envisaged by owner)	
2e	e. Fault level (MVA),Fault level duration(sec)	
2f	f. Cable glands & lugs details (shall be suitable for power cable)	
3	Type of DE/NDE Bearing	
4	Motor Paint shade	
5	Weight of	
5a	a. Motor stator (KG)	
5b	b. Motor Rotor (KG)	
5c	c. Total weight (KG)	
D	List of accessories.	
1	Space Heaters (Nos./Power in watts/supply voltage)	
2	Terminal Box for Space Heater (Yes/No)	

3	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4	Insulation of bearing (Yes/No)	
5	Noise reducer(Yes/No)	
6	Grounding pads	
6(i)	i) No and size on motor body	
6(ii)	ii) Nos on terminal Box	
7	Any other fitments	
E	List of curves.(All curves to be attached along with offer.	
1	Torque speed characteristic of the motor (enclosed yes / No)	
2	Thermal withstand characteristic (enclosed yes / No)	
3	Starting. current Vs. Time (enclosed yes / No)	
4	Starting. current Vs speed (enclosed yes / No)	
5	P.F. and Effi. Vs Load (enclosed yes / No)	

DE-1	LT MOTORS for Limestone Slurry Feed Pump	Bidder Response
A	GENERAL	
1	Manufacturer & Country of origin.	
2	Equipment driven by motor	
3	Motor type	
4	Quantity	
B	DESIGN AND PERFORMANCE DATA	
1	Frame size	
2	Type of duty	
3	Type of enclosure /Method of cooling/ Degree of protection	
4	Applicable standard to which motor generally conforms	
5	Efficiency IE3 of IS 12615(IE3) or above (vendor to fillup efficiency here)	
6a	Whether motor is flame proof	
6b	If yes, the gas group to which it conforms as per IS:2148	
7	Type of mounting	
8	Direction of rotation as viewed from DE END	
9	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11	Maximum continuous load demand of driven equipment in KW	
12	Rated Voltage (volts)	
13a	Voltage (volts)	
13b	Frequency (Hz)	
13c	Combined Voltage and Frequency	
14	Rated speed at rated voltage and frequency (RPM)	
15a	At rated Voltage and frequency: Full load current	
15b	At rated Voltage and frequency: No load current	
16	Power Factor at	
16a	a.100%/75%/50% load	
16b	b. NO load	
16c	c. Starting.	
17	Efficiency at rated voltage and frequency,	
17a	a.100% load	
17b	b. 75% load	
17c	c. 50% load	
18	Starting current (amps) at	
18a	a. 100 % voltage	
18b	b. 85% voltage	
18c	c. 80% voltage	
19	Minimum permissible starting Voltage (Volts)	
20	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
20a	a. Without driven equipment coupled	
20b	b. With driven equipment coupled	

21	Safe stall time with 100% ,110% & 80% of rated voltage	
21a	a. From hot condition	
21b	b. From cold condition	
22	Torques :	
22a	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
22b	b. Pull up torque at rated voltage.	
22c	c. Pull out torque	
22d	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
22e	e.Rated torque (kg.m)	
23	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24	GD2 value of motors	
25	No of permissible successive starts when motor is in hot condition	
26	Locked Rotor KVA Input	
27	Locked Rotor KVA/KW	
28	Vibration limit :Velocity (mm/s)	
29	Noise level limit (dBA)	
C	CONSTRUCTIONAL FEATURES	
1	Stator winding insulation	
1a	a. Class & Type	
1b	b. Winding Insulation Process	
1c	c. Tropicalised (Yes/No)	
1d	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
1e	e. Method of temperature measurement	
1f	f. Stator winding connection	
2	Main Terminal Box	
2a	a. Type	
2b	b. Location(viewed from NDE side)	
2c	c. Entry of cables(bottom/side)	
2d	d. Recommended cable size(To be matched with cable size envisaged by owner)	
2e	e. Fault level (MVA),Fault level duration(sec)	
2f	f. Cable glands & lugs details (shall be suitable for power cable)	
3	Type of DE/NDE Bearing	
4	Motor Paint shade	
5	Weight of	
5a	a. Motor stator (KG)	
5b	b. Motor Rotor (KG)	
5c	c. Total weight (KG)	
D	List of accessories.	
1	Space Heaters (Nos./Power in watts/supply voltage)	
2	Terminal Box for Space Heater (Yes/No)	

3	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4	Insulation of bearing (Yes/No)	
5	Noise reducer(Yes/No)	
6	Grounding pads	
6(i)	i) No and size on motor body	
6(ii)	ii) Nos on terminal Box	
7	Any other fitments	
E	List of curves.(All curves to be attached along with offer.	
1	Torque speed characteristic of the motor (enclosed yes / No)	
2	Thermal withstand characteristic (enclosed yes / No)	
3	Starting. current Vs. Time (enclosed yes / No)	
4	Starting. current Vs speed (enclosed yes / No)	
5	P.F. and Effi. Vs Load (enclosed yes / No)	

DE-1	LT MOTORS for Auxiliary Absorbent Tank Pump	Bidder Response
A	GENERAL	
1	Manufacturer & Country of origin.	
2	Equipment driven by motor	
3	Motor type	
4	Quantity	
B	DESIGN AND PERFORMANCE DATA	
1	Frame size	
2	Type of duty	
3	Type of enclosure /Method of cooling/ Degree of protection	
4	Applicable standard to which motor generally conforms	
5	Efficiency IE3 of IS 12615(IE3) or above (vendor to fillup efficiency here)	
6a	Whether motor is flame proof	
6b	If yes, the gas group to which it conforms as per IS:2148	
7	Type of mounting	
8	Direction of rotation as viewed from DE END	
9	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11	Maximum continuous load demand of driven equipment in KW	
12	Rated Voltage (volts)	
13a	Voltage (volts)	
13b	Frequency (Hz)	
13c	Combined Voltage and Frequency	
14	Rated speed at rated voltage and frequency (RPM)	
15a	At rated Voltage and frequency: Full load current	
15b	At rated Voltage and frequency: No load current	
16	Power Factor at	
16a	a.100%/75%/50% load	
16b	b. NO load	
16c	c. Starting.	
17	Efficiency at rated voltage and frequency,	
17a	a.100% load	
17b	b. 75% load	
17c	c. 50% load	
18	Starting current (amps) at	
18a	a. 100 % voltage	
18b	b. 85% voltage	
18c	c. 80% voltage	
19	Minimum permissible starting Voltage (Volts)	
20	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
20a	a. Without driven equipment coupled	
20b	b. With driven equipment coupled	

21	Safe stall time with 100% ,110% & 80% of rated voltage	
21a	a. From hot condition	
21b	b. From cold condition	
22	Torques :	
22a	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
22b	b. Pull up torque at rated voltage.	
22c	c. Pull out torque	
22d	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
22e	e.Rated torque (kg.m)	
23	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24	GD2 value of motors	
25	No of permissible successive starts when motor is in hot condition	
26	Locked Rotor KVA Input	
27	Locked Rotor KVA/KW	
28	Vibration limit :Velocity (mm/s)	
29	Noise level limit (dBA)	
C	CONSTRUCTIONAL FEATURES	
1	Stator winding insulation	
1a	a. Class & Type	
1b	b. Winding Insulation Process	
1c	c. Tropicalised (Yes/No)	
1d	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
1e	e. Method of temperature measurement	
1f	f. Stator winding connection	
2	Main Terminal Box	
2a	a. Type	
2b	b. Location(viewed from NDE side)	
2c	c. Entry of cables(bottom/side)	
2d	d. Recommended cable size(To be matched with cable size envisaged by owner)	
2e	e. Fault level (MVA),Fault level duration(sec)	
2f	f. Cable glands & lugs details (shall be suitable for power cable)	
3	Type of DE/NDE Bearing	
4	Motor Paint shade	
5	Weight of	
5a	a. Motor stator (KG)	
5b	b. Motor Rotor (KG)	
5c	c. Total weight (KG)	
D	List of accessories.	
1	Space Heaters (Nos./Power in watts/supply voltage)	
2	Terminal Box for Space Heater (Yes/No)	

3	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4	Insulation of bearing (Yes/No)	
5	Noise reducer(Yes/No)	
6	Grounding pads	
6(i)	i) No and size on motor body	
6(ii)	ii) Nos on terminal Box	
7	Any other fitments	
E	List of curves.(All curves to be attached along with offer.	
1	Torque speed characteristic of the motor (enclosed yes / No)	
2	Thermal withstand characteristic (enclosed yes / No)	
3	Starting. current Vs. Time (enclosed yes / No)	
4	Starting. current Vs speed (enclosed yes / No)	
5	P.F. and Effi. Vs Load (enclosed yes / No)	

DE-1	LT MOTORS for Primary Hydrocyclone Feed Tank Pump	Bidder Response
A	GENERAL	
1	Manufacturer & Country of origin.	
2	Equipment driven by motor	
3	Motor type	
4	Quantity	
B	DESIGN AND PERFORMANCE DATA	
1	Frame size	
2	Type of duty	
3	Type of enclosure /Method of cooling/ Degree of protection	
4	Applicable standard to which motor generally conforms	
5	Efficiency IE3 of IS 12615(IE3) or above (vendor to fillup efficiency here)	
6a	Whether motor is flame proof	
6b	If yes, the gas group to which it conforms as per IS:2148	
7	Type of mounting	
8	Direction of rotation as viewed from DE END	
9	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11	Maximum continuous load demand of driven equipment in KW	
12	Rated Voltage (volts)	
13a	Voltage (volts)	
13b	Frequency (Hz)	
13c	Combined Voltage and Frequency	
14	Rated speed at rated voltage and frequency (RPM)	
15a	At rated Voltage and frequency: Full load current	
15b	At rated Voltage and frequency: No load current	
16	Power Factor at	
16a	a.100%/75%/50% load	
16b	b. NO load	
16c	c. Starting.	
17	Efficiency at rated voltage and frequency,	
17a	a.100% load	
17b	b. 75% load	
17c	c. 50% load	
18	Starting current (amps) at	
18a	a. 100 % voltage	
18b	b. 85% voltage	
18c	c. 80% voltage	
19	Minimum permissible starting Voltage (Volts)	
20	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
20a	a. Without driven equipment coupled	

20b	b. With driven equipment coupled	
21	Safe stall time with 100% ,110% & 80% of rated voltage	
21a	a. From hot condition	
21b	b. From cold condition	
22	Torques :	
22a	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
22b	b. Pull up torque at rated voltage.	
22c	c. Pull out torque	
22d	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
22e	e. Rated torque (kg.m)	
23	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24	GD2 value of motors	
25	No of permissible successive starts when motor is in hot condition	
26	Locked Rotor KVA Input	
27	Locked Rotor KVA/KW	
28	Vibration limit :Velocity (mm/s)	
29	Noise level limit (dBA)	
C	CONSTRUCTIONAL FEATURES	
1	Stator winding insulation	
1a	a. Class & Type	
1b	b. Winding Insulation Process	
1c	c. Tropicalised (Yes/No)	
1d	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
1e	e. Method of temperature measurement	
1f	f. Stator winding connection	
2	Main Terminal Box	
2a	a. Type	
2b	b. Location(viewed from NDE side)	
2c	c. Entry of cables(bottom/side)	
2d	d. Recommended cable size(To be matched with cable size envisaged by owner)	
2e	e. Fault level (MVA),Fault level duration(sec)	
2f	f. Cable glands & lugs details (shall be suitable for power cable)	
3	Type of DE/NDE Bearing	
4	Motor Paint shade	
5	Weight of	
5a	a. Motor stator (KG)	
5b	b. Motor Rotor (KG)	
5c	c. Total weight (KG)	
D	List of accessories.	
1	Space Heaters (Nos./Power in watts/supply voltage)	

2	Terminal Box for Space Heater (Yes/No)	
3	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4	Insulation of bearing (Yes/No)	
5	Noise reducer(Yes/No)	
6	Grounding pads	
6(i)	i) No and size on motor body	
6(ii)	ii) Nos on terminal Box	
7	Any other fitments	
E	List of curves.(All curves to be attached along with offer.	
1	Torque speed characteristic of the motor (enclosed yes / No)	
2	Thermal withstand characteristic (enclosed yes / No)	
3	Starting. current Vs. Time (enclosed yes / No)	
4	Starting. current Vs speed (enclosed yes / No)	
5	P.F. and Effi. Vs Load (enclosed yes / No)	

DE-1	LT MOTORS for Absorber Area Drain Sump Pump	Bidder Response
A	GENERAL	
1	Manufacturer & Country of origin.	
2	Equipment driven by motor	
3	Motor type	
4	Quantity	
B	DESIGN AND PERFORMANCE DATA	
1	Frame size	
2	Type of duty	
3	Type of enclosure /Method of cooling/ Degree of protection	
4	Applicable standard to which motor generally conforms	
5	Efficiency IE3 of IS 12615(IE3) or above (vendor to fillup efficiency here)	
6a	Whether motor is flame proof	
6b	If yes, the gas group to which it conforms as per IS:2148	
7	Type of mounting	
8	Direction of rotation as viewed from DE END	
9	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11	Maximum continuous load demand of driven equipment in KW	
12	Rated Voltage (volts)	
13a	Voltage (volts)	
13b	Frequency (Hz)	
13c	Combined Voltage and Frequency	
14	Rated speed at rated voltage and frequency (RPM)	
15a	At rated Voltage and frequency: Full load current	
15b	At rated Voltage and frequency: No load current	
16	Power Factor at	
16a	a.100%/75%/50% load	
16b	b. NO load	
16c	c. Starting.	
17	Efficiency at rated voltage and frequency,	
17a	a.100% load	
17b	b. 75% load	
17c	c. 50% load	
18	Starting current (amps) at	
18a	a. 100 % voltage	
18b	b. 85% voltage	
18c	c. 80% voltage	
19	Minimum permissible starting Voltage (Volts)	
20	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
20a	a. Without driven equipment coupled	
20b	b. With driven equipment coupled	

21	Safe stall time with 100% ,110% & 80% of rated voltage	
21a	a. From hot condition	
21b	b. From cold condition	
22	Torques :	
22a	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
22b	b. Pull up torque at rated voltage.	
22c	c. Pull out torque	
22d	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
22e	e.Rated torque (kg.m)	
23	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24	GD2 value of motors	
25	No of permissible successive starts when motor is in hot condition	
26	Locked Rotor KVA Input	
27	Locked Rotor KVA/KW	
28	Vibration limit :Velocity (mm/s)	
29	Noise level limit (dBA)	
C	CONSTRUCTIONAL FEATURES	
1	Stator winding insulation	
1a	a. Class & Type	
1b	b. Winding Insulation Process	
1c	c. Tropicalised (Yes/No)	
1d	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
1e	e. Method of temperature measurement	
1f	f. Stator winding connection	
2	Main Terminal Box	
2a	a. Type	
2b	b. Location(viewed from NDE side)	
2c	c. Entry of cables(bottom/side)	
2d	d. Recommended cable size(To be matched with cable size envisaged by owner)	
2e	e. Fault level (MVA),Fault level duration(sec)	
2f	f. Cable glands & lugs details (shall be suitable for power cable)	
3	Type of DE/NDE Bearing	
4	Motor Paint shade	
5	Weight of	
5a	a. Motor stator (KG)	
5b	b. Motor Rotor (KG)	
5c	c. Total weight (KG)	
D	List of accessories.	
1	Space Heaters (Nos./Power in watts/supply voltage)	
2	Terminal Box for Space Heater (Yes/No)	

3	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4	Insulation of bearing (Yes/No)	
5	Noise reducer(Yes/No)	
6	Grounding pads	
6(i)	i) No and size on motor body	
6(ii)	ii) Nos on terminal Box	
7	Any other fitments	
E	List of curves.(All curves to be attached along with offer.	
1	Torque speed characteristic of the motor (enclosed yes / No)	
2	Thermal withstand characteristic (enclosed yes / No)	
3	Starting. current Vs. Time (enclosed yes / No)	
4	Starting. current Vs speed (enclosed yes / No)	
5	P.F. and Effi. Vs Load (enclosed yes / No)	

DE-1	LT MOTORS for Gypsum Area Drain Sump Pump	Bidder Response
A	GENERAL	
1	Manufacturer & Country of origin.	
2	Equipment driven by motor	
3	Motor type	
4	Quantity	
B	DESIGN AND PERFORMANCE DATA	
1	Frame size	
2	Type of duty	
3	Type of enclosure /Method of cooling/ Degree of protection	
4	Applicable standard to which motor generally conforms	
5	Efficiency IE3 of IS 12615(IE3) or above (vendor to fillup efficiency here)	
6a	Whether motor is flame proof	
6b	If yes, the gas group to which it conforms as per IS:2148	
7	Type of mounting	
8	Direction of rotation as viewed from DE END	
9	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11	Maximum continuous load demand of driven equipment in KW	
12	Rated Voltage (volts)	
13a	Voltage (volts)	
13b	Frequency (Hz)	
13c	Combined Voltage and Frequency	
14	Rated speed at rated voltage and frequency (RPM)	
15a	At rated Voltage and frequency: Full load current	
15b	At rated Voltage and frequency: No load current	
16	Power Factor at	
16a	a.100%/75%/50% load	
16b	b. NO load	
16c	c. Starting.	
17	Efficiency at rated voltage and frequency,	
17a	a.100% load	
17b	b. 75% load	
17c	c. 50% load	
18	Starting current (amps) at	
18a	a. 100 % voltage	
18b	b. 85% voltage	
18c	c. 80% voltage	
19	Minimum permissible starting Voltage (Volts)	
20	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
20a	a. Without driven equipment coupled	
20b	b. With driven equipment coupled	

21	Safe stall time with 100% ,110% & 80% of rated voltage	
21a	a. From hot condition	
21b	b. From cold condition	
22	Torques :	
22a	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
22b	b. Pull up torque at rated voltage.	
22c	c. Pull out torque	
22d	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
22e	e.Rated torque (kg.m)	
23	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24	GD2 value of motors	
25	No of permissible successive starts when motor is in hot condition	
26	Locked Rotor KVA Input	
27	Locked Rotor KVA/KW	
28	Vibration limit :Velocity (mm/s)	
29	Noise level limit (dBA)	
C	CONSTRUCTIONAL FEATURES	
1	Stator winding insulation	
1a	a. Class & Type	
1b	b. Winding Insulation Process	
1c	c. Tropicalised (Yes/No)	
1d	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
1e	e. Method of temperature measurement	
1f	f. Stator winding connection	
2	Main Terminal Box	
2a	a. Type	
2b	b. Location(viewed from NDE side)	
2c	c. Entry of cables(bottom/side)	
2d	d. Recommended cable size(To be matched with cable size envisaged by owner)	
2e	e. Fault level (MVA),Fault level duration(sec)	
2f	f. Cable glands & lugs details (shall be suitable for power cable)	
3	Type of DE/NDE Bearing	
4	Motor Paint shade	
5	Weight of	
5a	a. Motor stator (KG)	
5b	b. Motor Rotor (KG)	
5c	c. Total weight (KG)	
D	List of accessories.	
1	Space Heaters (Nos./Power in watts/supply voltage)	
2	Terminal Box for Space Heater (Yes/No)	

3	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4	Insulation of bearing (Yes/No)	
5	Noise reducer(Yes/No)	
6	Grounding pads	
6(i)	i) No and size on motor body	
6(ii)	ii) Nos on terminal Box	
7	Any other fitments	
E	List of curves.(All curves to be attached along with offer.	
1	Torque speed characteristic of the motor (enclosed yes / No)	
2	Thermal withstand characteristic (enclosed yes / No)	
3	Starting. current Vs. Time (enclosed yes / No)	
4	Starting. current Vs speed (enclosed yes / No)	
5	P.F. and Effi. Vs Load (enclosed yes / No)	

DE-1	LT MOTORS for Limestone Area Drain Sump Pump	Bidder Response
A	GENERAL	
1	Manufacturer & Country of origin.	
2	Equipment driven by motor	
3	Motor type	
4	Quantity	
B	DESIGN AND PERFORMANCE DATA	
1	Frame size	
2	Type of duty	
3	Type of enclosure /Method of cooling/ Degree of protection	
4	Applicable standard to which motor generally conforms	
5	Efficiency IE3 of IS 12615(IE3) or above (vendor to fillup efficiency here)	
6a	Whether motor is flame proof	
6b	If yes, the gas group to which it conforms as per IS:2148	
7	Type of mounting	
8	Direction of rotation as viewed from DE END	
9	Standard continuous rating at 40 deg.C. Ambient temp. as per Indian Standard (KW)	
10	Derated rating for specified normal condition i.e. 50 deg. C ambient temperature (KW)	
11	Maximum continuous load demand of driven equipment in KW	
12	Rated Voltage (volts)	
13a	Voltage (volts)	
13b	Frequency (Hz)	
13c	Combined Voltage and Frequency	
14	Rated speed at rated voltage and frequency (RPM)	
15a	At rated Voltage and frequency: Full load current	
15b	At rated Voltage and frequency: No load current	
16	Power Factor at	
16a	a.100%/75%/50% load	
16b	b. NO load	
16c	c. Starting.	
17	Efficiency at rated voltage and frequency,	
17a	a.100% load	
17b	b. 75% load	
17c	c. 50% load	
18	Starting current (amps) at	
18a	a. 100 % voltage	
18b	b. 85% voltage	
18c	c. 80% voltage	
19	Minimum permissible starting Voltage (Volts)	
20	Starting time with minimum permissible voltage/80%/ 100%/ 110%	
20a	a. Without driven equipment coupled	
20b	b. With driven equipment coupled	

21	Safe stall time with 100% ,110% & 80% of rated voltage	
21a	a. From hot condition	
21b	b. From cold condition	
22	Torques :	
22a	a. Starting torque at min. permissible voltage(kg-mtr.)/ rated voltage	
22b	b. Pull up torque at rated voltage.	
22c	c. Pull out torque	
22d	d. Min accelerating torque (kg.m) available at lowest permissible starting voltage	
22e	e.Rated torque (kg.m)	
23	Stator winding resistance per phase (ohms at 20 Deg.C.)	
24	GD2 value of motors	
25	No of permissible successive starts when motor is in hot condition	
26	Locked Rotor KVA Input	
27	Locked Rotor KVA/KW	
28	Vibration limit :Velocity (mm/s)	
29	Noise level limit (dBA)	
C	CONSTRUCTIONAL FEATURES	
1	Stator winding insulation	
1a	a. Class & Type	
1b	b. Winding Insulation Process	
1c	c. Tropicalised (Yes/No)	
1d	d. Temperature rise over specified maximum ambient temperature of 50 deg C	
1e	e. Method of temperature measurement	
1f	f. Stator winding connection	
2	Main Terminal Box	
2a	a. Type	
2b	b. Location(viewed from NDE side)	
2c	c. Entry of cables(bottom/side)	
2d	d. Recommended cable size(To be matched with cable size envisaged by owner)	
2e	e. Fault level (MVA),Fault level duration(sec)	
2f	f. Cable glands & lugs details (shall be suitable for power cable)	
3	Type of DE/NDE Bearing	
4	Motor Paint shade	
5	Weight of	
5a	a. Motor stator (KG)	
5b	b. Motor Rotor (KG)	
5c	c. Total weight (KG)	
D	List of accessories.	
1	Space Heaters (Nos./Power in watts/supply voltage)	
2	Terminal Box for Space Heater (Yes/No)	

3	Speed switch (Yes/No) No of contacts and contact ratings of speed switch	
4	Insulation of bearing (Yes/No)	
5	Noise reducer(Yes/No)	
6	Grounding pads	
6(i)	i) No and size on motor body	
6(ii)	ii) Nos on terminal Box	
7	Any other fitments	
E	List of curves.(All curves to be attached along with offer.	
1	Torque speed characteristic of the motor (enclosed yes / No)	
2	Thermal withstand characteristic (enclosed yes / No)	
3	Starting. current Vs. Time (enclosed yes / No)	
4	Starting. current Vs speed (enclosed yes / No)	
5	P.F. and Effi. Vs Load (enclosed yes / No)	

ANNEXURE –B
GENERAL TERMS & CONDITIONS
(FOR GUIDANCE TO THE SUPPLIERS)

A] Submission of Offer

a) Invitation for bid

Tenders are invited through electronic mode from eligible suppliers in case of open tenders and from suppliers to whom the enquiry is addressed in case of Limited / Single Tender.

The offers shall be posted into the system before the date and time specified in the tender.

The offer shall be sent on single part / two part / three part basis as specified in the main tender document.

Bids shall be submitted through e-Procurement portal, <https://bhel.abcprocure.com> of M/s e-Procurement Technologies, Ahmedabad who is our solution provider.

b) Hardware and Software requirements for participating in e-tender

Requirement for participating in e-Procurement is as under:

- i) A Computer with internet connectivity (Internet Explorer 9.0 (32-bit Browser only) & above)
- ii) Digital Signature Certificate (Class 3- SHA2-2048 BIT- with both Signing and Encryption component separately).
- iii) JAVA (Version 1.8 Update 45).
- iv) Steps for Hardware and software configuration is detailed at <https://bhel.abcprocure.com/EPROC/> under title “Minimum system requirements and Settings Document for BHEL User and Bidders”.

c) Instructions for Registered Suppliers

For all types of tenders (Single / Limited / Open) an automated email alert regarding issue of the Tender will be sent by the e-procurement portal to all Suppliers registered with BHEL, Ranipet for the item/s for which the tender is issued.

In case of open tenders, Registered suppliers with registered DSC will have to login with their user id/password & DSC and search for the Open Tender. To participate in event and to submit bid, a bidder needs to agree the terms and conditions.

Registered suppliers without DSC will have get their profiles approved by mapping DSC after login.

To know the procedure for obtaining Digital Signature Certificate (DSC), suppliers who are not having the DSC are advised to visit our website www.bhel.com → Tender Notifications → Sample Checklist.

d) Instructions for new suppliers wishing to bid against open tenders

New, unregistered suppliers wanting to bid against open tender/s will have to first register themselves in <https://bhel.abcprocure.com> as new supplier by clicking the “Register” button.

After entering the Income Tax Permanent Account Number (PAN) details and pressing “Enter”, they have to select the respective BHEL Unit for which they want to participate in the Open Tender and also fill up other relevant Company information as a one-time activity. On successful registration, your profile will be approved by the authorized officer and you can login to portal and can participate in the procurement event.

To participate in a tender, you need to login to the portal. You must be an approved registered user. If you are not a registered user, you can register yourself by clicking upon the “Register” link. You need to have a valid vendor code and password to login to the portal. Enter your Vendor code, password and click on Login button after Login, you need to select your digital signing and encryption certificates certificate. The DSC will be approved by M/s e-Procurement Technologies/ Authorised officer of BHEL.

As required by the tender, the necessary documents have to be filled-in online, in the provided template. Additional documents required are to be scanned and uploaded as .pdf file. Suppliers are advised to take note that the maximum space that is provided for uploading the documents that are to be attached is 300 MB. However the size of an individual document cannot exceed 10 MB. For any clarification on submission of offer on line, attention of the Supplier/s is invited to our document “Bidder Manual for BHEL Bidders” hosted in the home-page of the e-procurement portal. During normal business hours, helpline maintained by the service provider M/s e-Procurement Technologies is available for clarifying any doubts of supplier/s. The helpline numbers are +91-79-40270599/508/560/590/513 and email id is: Bhel.Support@abcProcure.com . Bidder can also refer to “Bidder Manual for BHEL Bidders” hosted in the home-page of the e-procurement portal <https://bhel.abcprocure.com>.

Typical documents that would be required as part of tender submission would be

- a) **Complete technical Offer** with details, catalogues, as applicable.
- b) **Un-priced bid** (i.e. Bid without the Price) as per given format, if any.
- c) **Filled-in BHEL’s Standard Terms & Conditions** as per Annexure enclosed with the Tender Document,
- d) **Deviation summary** submitted in two parts – giving the summary of technical deviations separately and the commercial deviations separately, if any and
- e) **Supporting documents** to substantiate equivalent material specifications / sections, where quoted for.
- f) Where asked for, **Client list** with their full address including detail of contact person with phone no., fax no. & e-mail ID (if any) to whom the same / similar items are supplied in the past two years. The date of supply may also be indicated, against each client.
- g) Suppliers can also upload their credentials by way of submission of Performance certificate/s issued by their customer/s detailing the quantity supplied and specification along with the un-priced PO copies and proof of supply along with the offer.

Technical acceptance of offer by BHEL shall be based on the evaluation of offer and the submitted documents.

- h) **Bidders who are not already registered with BHEL Ranipet** are requested to submit the Supplier Registration Form (SRF) online (<http://supplier.bhel.in/>) for evaluating and registering as an approved vendor. The Supplier Development Cell (SDC) of BHEL, Ranipet would process the SRF for evaluation / registering the Supplier. Don’t send hardcopies of SRF to BHEL-Ranipet, **only** online submission is accepted. This registration process is a separate / parallel activity and do not mix-up with submission offers.

Note

- (i) The materials offered, shall conform to the specification and scope attached in the tender.
- (ii) In case the offered materials are not conforming to the Enquiry material Specification, such offers would not be considered for evaluation and would be rejected.

Where equivalent specifications are offered, considering such offers will be at the sole discretion of BHEL. Wherever alternative standards / specifications are offered by Bidder, the Bidder shall provide sufficient documentary evidence to ensure equivalence to the designated standards / specifications, failing which the offer would be considered as not technically acceptable and hence shall stand rejected.

(iii) All taxes and duties payable as extra to the quoted price should be specifically stated in offers (as appearing in the online template).

Offer/s from within India shall be submitted along with the applicable HS Number and the applicable Goods & services Tax (GST) for each quoted item, failing which the purchaser will not be liable for payment of such taxes and duties. Our GST No: **33AAACB4146P2ZL**.

(iv) The un-priced bid shall be used to indicate relevant commercial terms such as scope of freight and insurance, applicability of duties and taxes etc. All Commercial terms are to be indicated clearly in the offer.

(vi) No changes shall be entertained once the bid is opened unless otherwise specifically agreed to in writing by BHEL.

(vii) Money values other than for those items appearing in the un-priced bid template shall not be indicated anywhere in the un-priced bid.

(viii) Time required for inspection (at Supplier's works), should be clearly given in terms of numbers of working days.

(x) **Offers sent by FAX / E-mail:** would not be entertained.

(xi) Bid should be free from correction, overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else bid shall be liable for rejection.

(xii) Registration process for items required by BHEL is always open at <https://supplier.bhel.in>. Prospective suppliers (including MSEs & owned by SCs/STs) may visit this site and apply for registration in the respective Unit.

Price Bid in conformance with the specification and terms as given in the Un-Priced bid document.

Caution on submission of price bids thru EPS:

The suppliers are severely cautioned to note that the price bid document accepts the price in figures only. It does not allow the supplier to write the value by words. Therefore all care shall be exercised by the supplier while filling in the figures. Once the price bid is opened no option is available for the supplier to retract the offer under any grounds. If a supplier, for any reason whatsoever approaches BHEL with a request for change in the price, it would be treated as going back on the offer submitted. In such cases, action would be initiated by BHEL for suspending further business dealings with such suppliers as per policy of BHEL which prevails at that point of time.

Foreign / Overseas suppliers are hereby informed that offers with differential currencies are not permitted for a given tender document.

Note

(i) The price break-up should be in line with technical specification / scope of the tender. (Cost of material, packing charges, forwarding charges, freight and insurance charges shall be shown appropriately, as applicable).

- (ii) Unless otherwise specified as a part of the tender condition, No Price Variation Clause will be entertained and No advance payment will be made by BHEL.
- (iii) In case, there is a discrepancy in the term quoted in techno-commercial bid and price bid, the term as per the techno-commercial bid (Part I) shall hold good and the commercial term quoted in the Price Bid (Part II) shall not be considered.
- (iv) In their own interest, all Tenderers are advised to double check their prices, applicable duties and taxes.
- (v) The quotation should be valid at least for a period of 90 days from the tender opening date.
- (vi) Indian bidders should submit the prices in Indian Rupees only.
- (vii) Foreign bidders may submit their bid in foreign currency. The currency for quoting shall be selected from the drop-down menu provided.
- (x) Indian Suppliers shall quote on FOR Destination basis only. Destination is BHEL, Ranipet Stores or BHEL Project Site as specified in the tender requirement. Foreign Suppliers shall quote on CFR Chennai Seaport Delivery and Insurance will be in BHEL's scope. No other delivery terms shall be acceptable. Shipment shall be arranged by the Seller on *Liner in / Liner out basis*. As per Government of India guidelines, BHEL Ranipet being a Government of India Undertaking the Bill of Lading shall be made with the Shipper as "Government of India". This shall be specifically confirmed by the Bidder.
- (xi) Where the cargo is containerized, Container washing charges, stuffing charges and / or any other such charges would be to the account of the supplier, where the containers are to be stuffed at the works of the supplier.

B] Opening of Offers

a) Tenders can be submitted up to 1400 Hours on tender opening due date. Part I will be opened on the same day at 1430 Hours. Results of the tender opening will be available for viewing for upto 7 days from the date of opening.

b) Requests by Bidders for extension of due date will not be entertained by BHEL.

c) Price Bid opening will be done through e-mode / Reverse Auction method (English method) which will be decided after techno-commercial bid evaluation is completed. All tenderers would have to specifically give their acceptance for this in their bid/s.

Note

- (i) Bids including all enclosures and supporting documents like catalogues, pamphlets, etc., shall be provided in ENGLISH language only.
- (ii) In exceptional circumstances, at its option, BHEL may consider extending the due date/s for the tender openings for reasons such as (but not limited to) paucity of offers etc. However, sufficient notice would be given by BHEL for such extension.
- (iii) Deviations shall be summarized and provided in a "Deviation Statement", listing the points and the deviation against each point.
- (iv) BHEL reserves the right to increase or decrease the tendered quantity and to order on more than one vendor at the lowest acceptable price to BHEL. In ordering on more than one source, the ratio of quantity split will be as specified in the tender terms.

If not explicitly specified, BHEL reserves the right to split the quantity of the enquiry as follows: 70% quantity being ordered on the original lowest bidder (L1) and balance 30% on the next higher bidder/s excluding H1, who accepts the L1 price. However, the final decision to split the order rests with BHEL only.

In the event that the other than L1 suppliers do not accept the L1 price, then the balance will be reverted to the original L1 and the original L1 shall be bound to accept the balance of the enquiry quantity kept reserved for order splitting. This decision would be given by BHEL within 60 days of the price bid opening.

Notwithstanding the quantum of split that may be indicated in the main body of the enquiry, bidders are advised to note that the splitting of the orders will be decided by BHEL after the evaluation of the techno-commercial and price bids.

(v) Offers for part quantities on item level basis are not acceptable to BHEL. While tenderers can quote for some or all the tendered items, no supplier shall quote for partial quantity of any given enquiry item. Such partial offer would not be considered in the enquiry for that item. Suppliers are to note that the evaluation unless otherwise specified will be on item level and not for the tendered items as a whole.

C] Evaluation of Offers

a) The price bids including the impact price (if any) of the technically acceptable offers alone shall be opened.

b) Offers with pre-conditions (like conditional discounts) for price are liable to be not considered / rejected. For evaluation such conditions would be removed and only the base offer would be considered for evaluation and comparison.

d) In the event of any change in scope / quantity arising out of the discussions, offerers would be given a chance to submit their revised offer / Impact bids. The option for the revised offer / impact offer will be triggered by BHEL. The Supplier then will have the facility to feed-in the revised price / impact price as per the provision given by BHEL. The impact price can be positive or negative (or nil). The impact price option shall contain only the price addition / deletion for such change in the scope / quantities, over and above the original scope and price quoted. The original price quoted would remain unchanged. The total price would then be computed by the arithmetic addition of the original price and the impact price. Where BHEL gives the option of submitting the revised offer, the impact would be computed as the arithmetic difference of the revised price and the original price.

e) For evaluating the overseas offers, CFR Chennai Sea Port price quoted will be taken into account. The cost to BHEL will be arrived at by loading the applicable customs duty project wise, insurance charges, inland transportation charges to BHEL stores and LC charges etc.,

f) Deleted.

g) BHEL reserves the right to reject without assigning any reasons / load any offer with factors other than already specified for such offers having deviations to BHEL Specifications, Standard Terms & Conditions at its discretion. The decision of BHEL in this regard shall be final.

h) BHEL reserves the right to reject an offer due to unsatisfactory performance during tender finalisation / execution of a contract at any of BHEL projects / units in the past or if unsatisfactory performance report is received from the party/s referenced by the supplier at any time during tender finalisation.

- i) BHEL reserves the right to operate Purchase / Price preference to Government of India Undertakings, which shall be given as per the guidelines of Government of India given from time to time and / or relax the Terms and Conditions of the tender.
- j) For the purpose of comparing prices, tender prices shall be converted to Indian rupees and the conversion shall be made by using the TT Selling rate of State Bank of India (SBI) prevailing on the date of opening of Techno-Commercial / Unpriced bids. If the relevant day happens to be a bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken. This exchange rate will be followed till placement of order. Tenderers may please note that even if an impact price is taken as in (d) for purpose of price evaluation and arriving at the rank; the exchange rate will be taken as explained above.
- k) Unless otherwise specified, evaluation will be on individual line item basis only and ordering will be on respective L1 vendors.
- l) BHEL reserves the right to conduct negotiations on the “Price” and “Other Commercial Terms and Conditions” with the lowest ranked offerer at any time after the bid opening but before the release of the Purchase Order and If so required by BHEL, Supplier may have to share their costing sheet with BHEL.
- m) Bidders are required to confirm in writing in their techno-commercial document that other than themselves (the bidder) none of its group companies, concerns or affiliates etc., are participating in the tender either directly or indirectly or through any other agency under the same proprietor / common partner(s)/ common Directors. If during the evaluation of the bids it is found that the bidder has submitted the offer in violation of this condition then all the offers received from the group companies would stand rejected. If such relationship is found at a later date where the Purchase Order has been issued, then BHEL would cancel the Purchase Order and initiate suitable action/s under the contract/s including but not limited to invoking the Risk Purchase clause of the order and other applicable legal provisions / guidelines of BHEL including guidelines on suspension of business dealings. (Please see clause L sub-clause c).
- n) For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018 and subsequent orders issued by the respective nodal ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/PO/WO against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and/ or local content in respect of this procurement, same shall be applicable.

Preference to Make in India including counter offering will be as per the Public Procurement (Preference to Make in India), Order 2017 available in the following link

http://dipp.nic.in/sites/default/files/publicProcurement_MakeinIndia_15June2017.pdf

http://dipp.nic.in/sites/default/files/Revised-PPP-MII-Order-2017_28052018.pdf

D] Execution of the Order

a) BHEL will have the option to pre-inspect the materials at Supplier's works by BHEL's own inspector or by third party agency appointed by BHEL or BHEL's end customer/s. The mere act of the pre-dispatch inspection (PDI) does not absolve the Supplier from giving the specifications as agreed upon in the Purchase Order. In the case of inspection being carried out by a third party inspector (TPI) as per the extant practice, the TPI would forward the Inspection Report (IR) along with Test Certificates and other related documents to the Quality Assurance (QA) Department of BHEL. The QA department after scrutinising the report/s submitted by the TPI would issue the Material Dispatch Clearance Certificate (MDCC). Suppliers are hereby



informed that materials should be dispatched only after getting the MDCC, failing which the materials may be rejected on receipt at BHEL Stores.

b) In the case of overseas suppliers Inspection call for carrying out the inspection shall be given 30 days before the scheduled contract delivery date. The Inspection date/s given by the Supplier shall be on firm basis. For local Suppliers the Notice period of Inspection shall be 10 working days.

c) Deviations, if any pointed out by the visiting Inspection team of BHEL shall be corrected and the items as per specification shall be dispatched on or before the contract delivery date after getting the MDCC.

d) The final inspection for acceptance will, however be carried out at BHEL's works at Ranipet.

e) The contract delivery date is the date of receipt at BHEL Stores for suppliers in India, applicable in the case of FOR Destination Contracts.

For ex-works contracts or FOR dispatching station indigenous contracts, the date of the Lorry way bill issued by the authorised transport carriers of BHEL / Railway Receipt / Courier Way bill / Airway bill or any such dispatch documents of carriage approved by BHEL would be considered as the Contract Delivery Date. In the case of CFR contracts with overseas suppliers, the B/L date shall be taken as the Contract Delivery Date

f) Travel & other local stay cost for the Inspectors sent by BHEL will be to BHEL account, but other Inspection Charges, if any shall be to the account of the Seller only.

g) The supplier shall arrange for packing suitably in all respects for normal transport by sea / rail / road and Materials shall be suitably protected against effect of tropical salt laden atmosphere in the event of shipment being delayed at ports / store yards and as per BHEL TDC.

h) Foreign suppliers shall dispatch on CFR agreed Sea-Port basis, according to the contract conditions. Indian suppliers shall dispatch on free delivery (door-delivery) at BHEL stores basis only. Unloading the materials at BHEL Stores would be to the account of BHEL only.

i) In the event of any short supply, it shall be the responsibility of the supplier to deliver such short supplied/ missing items on Free-of-Cost basis at BHEL stores, including customs clearances at Indian Ports in the case of foreign suppliers.

k) Terms of payment:

k.1) For Indigenous Suppliers: Unless otherwise agreed to by BHEL, the standard payment terms of BHEL shall be: For non-MSE suppliers 100% payment made directly through EFT within 90 days from the date of receipt and acceptance of materials at BHEL Stores, Ranipet or 90 days from the date of acknowledgement of receipt of materials at destination specified. If any supplier asks for payment terms other than the above specified, then suitable loading on cost will be considered. **Loading of any deviation in the payment terms w.r.t tender terms will be "Base rate of State Bank of India (SBI) (as applicable on the date of bid opening: Techno-commercial bid opening in case of two part bids) + 6%, will be considered for loading for the periods of relaxation sought by bidders.**

k.2) For MSE vendors (under Micro & Small category alone) 100% payment will be made within 45 days from the date of receipt and acceptance of materials at BHEL Stores, Ranipet or 45 days from the date of acknowledgement of receipt of materials at destination specified.

l) NOTE:

Where the destination specified is other than BHEL Stores Ranipet, for claiming payment, Supplier has to submit proof of receipt of the materials at the destination by furnishing a copy of the acknowledged despatch document (LR/RR/Courier receipt etc.) .

If the Bidder is bidding for the first time and wants to be considered as an MSE then, the Bidder shall submit document evidencing that they are an MSE along with a certificate from a Chartered Accountant certifying the status of their Unit / Works clearly specifying the address of the works which is to be considered as MSE and send the same to BHEL, Ranipet either before the tender opening date or upload it as a part of the tender document in the e-procurement portal. Where the document is submitted electronically a hard copy shall invariably be sent within a reasonable period (not exceeding 30 days) from the bid opening date for the purpose of BHEL's records. If the hard copy is not received within this specified time, then the supplier would be treated as a non-MSE. BHEL will not be responsible for any postal / courier / delivery delays.

For approved vendors the status as on the date of the bid opening as available with BHEL Ranipet's records shall be used for reckoning the status of the Bidder as an MSE or otherwise.

Offer/s received without these documents will be treated as non-MSE and order finalization will be done based on this premise. Documents submitted after Bid-opening will not be considered in this tender. This provision for MSE will apply subject to the condition that the participating MSE meets the tender requirements.

For approved suppliers, in case of any change in the MSE status, it shall be the responsibility of the Bidder to notify the change as a part of the Bid document. If at a later date it comes to the knowledge of BHEL, Ranipet that the change in the status has not been intimated by the Bidder and the order is obtained under the premise of an MSE then BHEL would cancel the pending order against this tender and take necessary steps for suspension of the business dealing with the Bidder as per the procurement policy of BHEL. Similarly if a supplier claims MSE status after the Part I bid opening, then the same would not be considered in the tender.

In case after the bid opening it is seen that no MSE has become L1, then depending on the nature of the item, if it is not possible to split the tendered items / quantities on account of reasons like customer contract requirements of supplying one make for a given project or technical reasons like the tendered item being a system etc. then BHEL would not counter offer the L1 prices even though there may be MSE bidders within the +15% band of L1.

Other concessions for MSEs / Reserved sectors (Also for women owned MSEs and MSEs owned by SC/STs)

In addition to the concessions specified above, MSE suppliers will be eligible for such other concessions as per the MSME Act 2006 and any other benefits / concessions that may be announced by the Government of India from time to time.. However, such concessions as applicable at the time of tender opening alone will be applicable. Any concessions advised after tender opening will not be considered for the current tender.

Items that are reserved for MSE and for any other items for which reservations for Indian manufacturers are notified by the Govt. Of India, such concessions as prevailing on the date of tender opening shall apply as a part of this tender conditions.

ii) Foreign Suppliers "100% thru' irrevocable & unconfirmed LC at sight within 3 weeks from the PO date through any one of our Bankers listed elsewhere in the tender conditions for 100% value (less Agency Commission, if any) valid up to the PO delivery period and 15 days thereafter for negotiation. All bank charges in India to BHEL's account and all other charges outside India to Supplier's account. **BHEL would load the price of foreign suppliers in order to bring them on common platform as per Indigenous**

Suppliers on the account of differential payment terms to Indigenous Suppliers. Loading of payment terms will be “Base rate of State Bank of India (SBI) (as applicable on the date of bid opening: Techno-commercial bid opening in case of two part bids) + 6%, will be considered for loading for the periods of relaxation compared to indigenous suppliers i.e. 90 days.

m) Any incidence of tax like Income tax, Goods & Services Tax (GST) and Withholding any other similar tax / duties /levies imposed by the Government of India, or the State Government, where the BHEL Unit is located, deductible at Source, during the tenure of the Order shall be deducted by BHEL and necessary certification of the deduction (Tax deduction at Source) would be given. This is subject to the supplier fulfilling the necessary documentation as specified by the Government of India. (e.g. Tax Residency Certificate, PAN Number etc.)

n) The Guarantee period shall start from the “Date of receipt and acceptance of the materials at BHEL Stores.”

E] Liquidated Damages Clause:

BHEL will levy penalty as Liquidated Damages (LD), for delay in delivery. The damages shall be at the rate of ½% per week or part thereof subject to a maximum of 10% PLUS applicable Goods & Services Tax (GST). The contract delivery date for purpose of L.D is the date of receipt at BHEL Stores for suppliers in India for F.O.R. Destination Contract and the date of dispatch clearance given by BHEL for overseas suppliers. For ex-works or F.O.R dispatching station contracts, the date of the dispatch document will be reckoned as the date of delivery for computing the LD. Supplier shall deduct the applicable LD from the first payment when raising the claim for the same. The applicable LD if any would be communicated by BHEL along with the dispatch clearance. It is taken by BHEL that Foreign Suppliers have confirmed their acceptance to BHEL for opening the LC for value which is the value of the order reduced by the applicable LD. The LD would apply on the undelivered portion only. In case of reasons attributable to BHEL for the delay in delivery (for e.g. delay in arranging the pre-inspection) then the delivery time would be reset to the extent of the time delay attributable to BHEL, with waiver of the LD. Delivery being the essence of BHEL’s contract requirements, unless otherwise specified the LD would apply on the undelivered portion of the contracted items. **In the event that a Supplier does not accept the LD condition above, the offer would be loaded to the extent of the shortfall with respect to upper limit specified above.**

F) Miscellaneous

i) Role of Principals and Agents:

BHEL will deal directly with indigenous manufacturers only.

BHEL strongly discourages the engagement of Agents in India by foreign principals, to deal with BHEL, in BHEL’s tenders.

BHEL will not enter into any correspondence with an Indian Agent.

The Indian Agent will not be extended the privilege given to the principals, such as that of attending the tender openings, attending technical discussions, commercial discussions or price negotiations and such like.

In case, in spite of the above, a foreign principal insists on engaging an Indian Agent, It is made clear by BHEL that:

It is the sole responsibility of the foreign principal to ensure the Agent does not represent any other foreign principal in a given tender.



An undertaking to this effect shall be given by the foreign principal that his / her Agent does not represent any other foreign principal in the tender. This document shall form a part of the techno-commercial offer.

A Principal shall authorise only one Agent to quote against each BHEL's tender. In the event a Principal authorises more than one agent to quote against a BHEL's tender, then all such offers will be rejected by BHEL in that tender. Principals are also advised to include BHEL's tender Number / Reference in their authorisation issued to the Agent.

If at any stage of the tender, BHEL finds that an Indian Agent has represented more than one foreign principal, all such offers of and all the foreign principals would be disqualified summarily in the tender inquiry.

BHEL will only give an intimation of notice of the disqualification. No correspondence would be entertained by BHEL, on their decision. Such decision of BHEL shall be irrevocable, firm and final and shall be binding on the tenderer.

BHEL, due to business reasons would ban, would have banned Indian agents from dealing with BHEL.

Any foreign principal who engages such a banned agent, or an employee of the banned agency, or any other person connected with the banned agency, at any time during the tender proceedings, would be disqualified from the tender proceedings. The decision of BHEL in this regard shall be final and be binding on the OEM.

Hence in their own interests, prospective tenderers may check with BHEL, the status of their proposed agent vis-à-vis BHEL.

In view of the requirement of BHEL, it is strongly suggested that in their own interest, foreign principals may desist from engaging any Indian agent and deal with BHEL directly and it is stressed that any Main producer proposing to deal with BHEL by engaging and through an Indian Agent does so at their own risk.

BHEL shall in no way be responsible for any consequences that may arise to the foreign principal on account of the antecedents / actions of their Indian Agent.

In the event of the foreign principal engaging an Indian Agent:

a) The Supplier shall furnish an authenticated copy of the Agency Agreement with his agent detailing the precise relationship between them and their mutual interest in the business along with techno-commercial bid.

b) The Supplier shall furnish original authorization letter for the Indian Agent. The letter shall contain name, contact person, complete postal address including phone, fax and e-mail ID. It shall also spell out the type of services to be rendered by Indian Agent.

c) Indian Agent & Agency commission: An Indian Agent can represent only one Foreign Manufacturer against a particular Tender. The CFR price quoted by the foreign bidder shall include the agency commission. However, the agency commission component payable to their Indian Agents shall be shown separately in the Offer, either as a lump-sum or as a percentage of the quoted price. This will be paid by BHEL in Indian Rupees, on satisfactory receipt & acceptance of the materials. For calculation of Rupee equivalent of Agency Commission, exchange rate as prevailing on the date of Purchase Order will be taken and

d) For all discussions, technical clarification and negotiations etc. only the principal would be authorized for interaction with BHEL. The Agent shall not be a party to the discussions / negotiations and would not be normally allowed to participate.

ii) Terms & Conditions of Letter of Credit (L/C) for overseas suppliers (indicated for acceptance).

a) Unconfirmed irrevocable Letter of Credit at Sight only will be opened by BHEL. Confirmation of L/C is not preferred by BHEL. Also L.C will be opened in Lots in line with the staggered delivery.

b) All Bank charges out side India are to the Supplier's account and within India to BHEL's account.

c) In case of L/C extension caused by delays attributable to the Supplier, the L/C extension / commitment charges are to be borne by the Supplier.

iii) Other terms & conditions for letter of credit: - Documents for negotiation

a) Signed Commercial invoice in quadruplicate, for a value not exceeding the draft amount, quoting the import Licence No and certifying goods evidencing shipment of the merchandise are as per Applicant's Purchase Order. The amount of invoice after deducting Indian Agent's commission, if any, should not exceed the Credit amount. (The Indian agent's commission, if any, is payable in India in Indian rupees only.)

b) Certificate of Country of Origin, from the country of manufacture, issued by the Chamber of Commerce.

c) One set of Original and two sets of Non-negotiable copies of 'signed', 'unmarked', 'clean on board' Ocean Bill of Lading, showing Shipper as "Government of India" Account M/s. Bharat Heavy Electrical Ltd, Unit: BHEL, Ranipet as consignee (The opening bank should not be notified as consignee), marked freight payable / prepaid at destination.

d) Packing list in 4 copies in English, indicating Size wise Number of bundles / pieces shipped and weight.

e) Certified copy of the fax / e-mail sent by the beneficiary to the applicant giving the following particulars of shipment, as the insurance is to be arranged by the Applicant in India: (a) Purchase Order Number & date; (b) Bill of Lading Number & date (c) Name of vessel; (d) Port of Loading; (e) Number of bundles / pieces and weight; (f) Invoice Number, date and value (g) Purchase Order item number's despatched. The cable / fax is to be sent within 2 working days of shipment.

f) Beneficiary's certificate showing the relevant airmail / courier reference no. and date that the following clauses have been complied with:

1] Beneficiary to forward by Registered Airmail / Courier one complete set of original documents and one set of non-negotiable documents within 3 working days of obtaining shipping documents to Regional Manager (ROD), Bharat Heavy Electricals Ltd, 6th Floor, EVR Periyar Bldg. No 690 (Old 474), Anna Salai, Nandanam, Chennai-600035. India. (Phone: +91-24330931, 24330253; e-mail: pbpwar@bhel.in)

2] Beneficiary to courier at his cost 3 copies of complete set of non-negotiable documents to the Officer who released the Purchase Order.

3] Declaration by the Supplier certifying that the contents in each case are not less than those entered in the invoices / packing list and that the invoicing for the supplies effected is strictly in accordance with agreed rates as stipulated in the Purchase Order.

4] Declaration to the effect that all other documents as per purchase order has been couriered to the Purchase order releasing authority

5) The carrying steamer should be seaworthy, less than 25 years of age and approved by Lloyds / Classification Societies / General Insurance Corporation of India from time to time and

6) Copy of Dispatch Clearance / Instruction issued by BHEL.

iv) Documents to be sent directly to the Purchaser prior to shipment

- a) Manufacturer's Original Internal Inspection / Test certificate in triplicate.
- b) Manufacturer's Original Guarantee certificate as per Purchase Order. The material shall be guaranteed for a period of 12 months from the date of acceptance of the materials at BHEL stores or 18 months from the date of dispatch whichever is earlier. The acceptance would be evidenced by the Stores Receipt Voucher (SRV) which will be raised by BHEL.
- c) Inspection / Test Certificate issued by BHEL / Inspection agency specified in the Purchase Order. In the event that Inspection prior to dispatch is not carried out by the Engineers of BHEL, the Inspection certificate of the third party so authorized by BHEL and
- d) Any other documentation as specified in the Purchase Order.

v) Conditions for transportation:

- a) All shipping documents shall show the Purchase Order Number & Date, Import Licence Number & Date, and Letter of Credit Number & Date.
- b) Transshipment is to be avoided.
- c) Loading on deck is not permitted. The transport document must not contain a provision that goods may be carried on deck.
- d) A transport document which is produced or appearing to have been produced by reprographic, automated or computerized systems or as carbon copy will be accepted as an original document provided that it is marked as original and is ink-signed.
- e) The transport document must contain all the conditions of carriage on the original document.
- f) The transport document must not indicate the place of destination as being different from the port of discharge.
- g) The transport document must not contain the indication 'intended' or similar qualification in relation to the vessel or other means of transport or port of loading or port of discharge.
- h) The transport document must be issued by the carrier or his agent and not by any freight forwarder.
- i) Transport documents bearing reference by stamp or otherwise, to costs additional to the freight charges are not acceptable.
- j) The Bills of Exchange must be dated and presentation of documents for negotiation must not be later than 15 days after the date of shipment and in any case not later than the expiry date of the Credit.
- l) Indian suppliers shall dispatch the materials on freight prepaid and on door-delivery basis (FOR Destination – Destination: BHEL Stores) and
- m) In the event there is a delay by the Supplier in negotiating / submitting the document, any demurrage / wharfage arising out of the same shall be to the account of the Supplier and shall be deducted from the final payment. Also, in such cases, the Supplier shall authorize the Steamer / Shipping agent / transporter to freely release the consignment to BHEL by providing a “Surrender Bill of Lading”. Over-seas Suppliers have to give a No-Objection Certificate to BHEL, authorizing BHEL to get the Delivery Order from the Steamer

Agent without producing the Original Bill of Lading. This is required to ensure avoidance of incidence of demurrage at Chennai Sea-port that may arise in case of delayed presentation of documents by the Seller.

G) Reverse auction (RA) / on-line bidding on internet:

1. *"BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders shall give their acceptance with their offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of the bids, in case BHEL decides to go for RA."*

2. *Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for "Suspension of Business Dealings with Suppliers/ Contractors (as available on www.bhel.com)."*

3. The philosophy followed for reverse auction shall be English Reverse (No ties).

4. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.

5. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.

6. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.

7. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.

8. Bidders have to fax the Compliance form (annexure IV) before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.

9. Reverse auction will be conducted on scheduled date & time.

Note: Decision to go for RA or not will be on case to case basis.

10. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.

11. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, to the Service provider within two working days of Auction without fail.

12. Bidders are be required to read the "Terms and Conditions" section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the „Business Rules of Reverse Auction“, which will be communicated before the Reverse Auction.

13. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines, shall be initiated by BHEL and the results of the RA scrapped/ aborted.

14. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.
15. The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with their offer. The envelope sealed price bid of successful L1 bidder in RA, if conducted, would also be opened after the RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. It is considered that the bidder having submitted their offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rate/s.
16. If it is found that L1 bidder has quoted higher in the online sealed bid in comparison to the envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com)."
17. The calculation sheet e.g. excel sheet (which will help to arrive at 'Total Cost to BHEL') will be communicated to respective bidders of RA by BHEL. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Goods & Services Tax (GST) and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.]
18. This calculation sheet will be finalized based on the evaluation criteria specified in the NIT.
19. Suppliers are required to submit their best price bid in a separate sealed cover along with techno-commercial bid. After evaluation of Techno-Commercial Bids:
- a) In case BHEL decides not to conduct RA, the envelope sealed price bids of all techno-commercially qualified bidders, along with price impact, if any, would be opened and processed as per extant the internal Purchase/ Works Policy as applicable to BHEL.
 - b) In case BHEL decides to conduct RA, business rules of RA will be sent to service provider.(See Annexure for Model General Business Rules of RA.)
20. Generally the start price for the RA would be the lowest of
- a) Lowest online sealed bid and
 - b) Internal Estimate of BHEL
- Note: Wherever more than one lowest online sealed bids are identical and lower than the estimate, the start price, would be that price arrived by reducing the lowest online sealed bid by maximum of one decrement.*
21. Reverse auction process would deemed to have started upon receipt of 'Online Sealed Bids' from the bidders within the prescribed time frame as per Business Rules.
22. After receipt of 'online sealed bids', the start price & bid decrement will be decided by BHEL and the same would be communicated to the service provider, to start the bidding process.
23. Only those bidders who have submitted the 'online sealed bid' within the scheduled time would be eligible to participate further in RA process. However, the H1 bidder (whose quote is highest in online sealed bid) will not be allowed to participate in further RA process provided minimum three bidders are left after removal of H1 bidder. In case of tie for H1 bid (identical online sealed bids), 15 minutes additional time

would be provided and all the participating bidders would be informed by mail/ message on bidding screen to enable bidders submit revised online sealed bids so as to break the tie.

24. If the lowest online sealed bid is the starting price, then the lowest bidder in online sealed bid shall be shown as current L1 automatically by the system. System would have the provision to indicate this bid as current L1 for further bidding.

25. If the start price is lower than the lowest online sealed bid, on acceptance of such start price by any bidder, this bid would be indicated as current L1 for further bidding.

26. In case of no further bidding, RA will be deemed to have been successful with current L1 bidder.

27. All bidders who had given online sealed bid would be able to see their rank and L1 price and their ranking L1, L2 etc. would be based on their last quoted price irrespective of quote received in RA or online sealed bid.

28. RA shall be treated as failed in the following scenarios:

a) In cases where the start price is (a) estimate or (b) one decrement (maximum) lower than the lowest of the online sealed bids and no bidder accepts the start price.

b) In cases where the number of online sealed bids are less than four before removal of highest bidder.

c) In cases of tie among H1 bidders, even after extension of submission of online sealed bids once by 15 minutes.

d) Wherever, the evaluation is done for individual line items, RA shall be treated as failed only for those line item(s) for which any of the above a), b) or c) satisfies.

29. In cases of failure of RA, sealed envelope price bids (of item(s) for which RA has failed) of all the techno-commercially qualified bidders would be opened and the tender would be processed accordingly. However, the envelope sealed bid(s) of techno-commercially acceptable bidder(s) who had agreed to participate in the RA and had failed to submit the online sealed bid would not be opened.

30. After declaring L1 upon completion of RA, the envelope sealed price bid of L1 bidder would also be opened for placement of order on lower of the two bids (RA closing price & envelope sealed price) and the offers would be processed as per extant their internal Purchase/ Works policy provisions of BHEL. Action as per NIT terms would be taken if online sealed bid is higher than the envelope sealed bid.

31. Relative position of bidders (for usage in cases of predefined splitting the quantities) would also include bidders who have given 'online sealed bids' but have not given further bids in auction. In case of splitting requirement, H1 bidder may be considered for counter offer if the pre-stated (NIT) numbers of suppliers do not accept the counter offer. However, principle of splitting to N-1 bidder would be maintained.

32. In case H1 bidder happen to be MSE and was removed from further bidding but is within L1 + 15% band, then this bid would be considered and to be processed in line with 'Public Procurement Policy for Micro & Small Enterprises (MSEs) order, 2012'.

33. For providing preference to domestically manufactured Electronic Products, in accordance with Department of Electronics and Information Technology (DeitY) Gazette Notification No. 33(3)/2013-IPHW dated 23.12.2013 and its related notifications issued from time to time, H1 bidder removed from further bidding would be considered for counter-offer to meet domestic bidder requirement for the item(s) under procurement.

34. In case BHEL decides not to go for Reverse Auction for the tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL would be opened as per BHEL's standard practice.

35. In case of enquiry through e-Procurement, the sealed electronic price bid (e-bid) would be treated as sealed envelope price bid.

Note: In order to bring more transparency and to address any queries of Bidders on Reverse Auction, an abridged version of BHEL's "Common Guidelines for conducting Reverse Auction (RA)" has been hosted in BHEL's web site www.bhel.com under the links "Supplier Registration Page" and "Tender Notification". All Bidders are requested to visit the link and familiarize themselves with BHEL's RA procedures and guidelines before submission of their bid/s. Submission of Bid shall mean that the Bidder has read and understood BHEL's RA procedures and the bid is in agreement with the same.

H] Force Majeure

If at any time during the currency of this contract, the performance in whole or in part, by either party of any obligations under this contract shall be prevented or delayed by reason, of any war, hostilities, acts of the public enemy, civil commotion, sabotage, fires, explosions, epidemics, quarantine, restrictions or acts of GOD (hereinafter referred to as events), then provided notice of happening of any such events is given by either party to other within ten days from the date of occurrence thereof, neither party shall reason of such events be entitled to terminate this contract nor shall either party have any such non performance and delay is resumed as soon as practicable after such events has come to an end or ceased to exist. If the performance in whole or part of any obligation under this contract is prevented or delayed by reason or any such event claims for extension of time shall be granted for period considered reasonable by the purchaser subject to prompt notification by the seller to the purchaser of the particulars of the events and supply to the purchaser if required of any supporting evidence. Any waiver of time in respect of partial installment shall not be deemed to be a waiver of time in respect of remaining deliveries.

I] Cancellation of Order:

In the event of non-performance of the contract by the Supplier, BHEL reserves the right to cancel the order with issue of a written notice. BHEL would provide a curing period of 30 days, for the Supplier to rectify the situation. If the Supplier fails to rectify the reason/s that led to the issue of cancellation notice by BHEL, then the cancellation order would be issued automatically by BHEL, without further recourse to the Seller. BHEL will not pay any cancellation charges or any other charges / damages to the Supplier, arising out such cancellation. In the event of the non-performance of the supply contract, by the Supplier, the rights of BHEL include, in addition to cancelling the order, to take alternate purchase action at the cost and risk of the supplier. The additional expenditure to be incurred by BHEL in such alternate purchase would be to the account of the supplier. (Risk Purchase). This remedy would be in addition to the invoking of the CEBG on grounds of failure of the Supplier in executing the Contract and any other legal remedies." BHEL reserves the right to initiate the alternate purchase action at the cost and risk of the erring supplier by issue of a simple notice of intention for the alternate purchase action duly sent by any electronic means and / or by a letter. The cancellation of the order would not be a pre-condition for initiation of the alternate purchase action.

J] Contract Execution Bank Guarantee:

To demonstrate the fidelity of the successful bidder, in executing the Contract, on receipt of the Letter of Intent / Purchase Order, the Supplier shall arrange to provide a contract execution bank guarantee (CEBG). The format of the CEBG is a part of this enquiry. The format may be downloaded and necessary stamping may be obtained from the Banker towards submission of the CEBG. The indigenous suppliers have to provide the CEBG from any one of the Nationalized Banks, listed in the annexure to these terms. Overseas suppliers can submit the CEBG from any of the reputed International / National Bankers. However the CEBG is to be confirmed by any of the Bankers listed by us. In the event of failure by the Supplier to execute the contract either fully or partially, BHEL would encash the entire CEBG. The CEBG shall be valid for the period covering the agreed delivery date of the order with a further claim period of 3 months on the last specified delivery date. In the event of the failure of delivery BHEL would proceed with encashing the CEBG without reference to the Supplier. In the event of BHEL granting extension of the delivery dates, then the CEBG validity shall also be got extended by the Supplier to the extent of the extended delivery times together with the claim period as specified elsewhere. **The CEBG shall be for a value of 2% of the Purchase order.**

Suppliers who are all already registered with BHEL and having a vendor performance rating of A or A+ grade would be exempted from submission of CEBG.

Performance Bank Guarantee

Where ever so required, the Supplier shall arrange to provide a Performance bank guarantee (PBG). The indigenous suppliers have to provide the PBG from any one of the Nationalized Banks, listed in the tender terms. Overseas suppliers can submit the PBG from any of the reputed International / National Bankers. However the PBG shall be confirmed by any of the Bankers listed by us. The PBG shall guarantee the performance of the equipment / materials / items supplied and shall cover the guarantee period. The PBG shall have a claim period of 3 months in addition to the guarantee period. In the event of failure of the supplies made within the guarantee period, BHEL would encash the entire PBG. **The PBG shall be for a value of 10% of the Purchase order.**

The supplier/s have to get the PBG format (pre-printed) from BHEL and get the same stamped by the Banker. Change of PBG terms either by the supplier's Banker or by the supplier, after servicing of the order is not acceptable. Similarly PBG prepared by the supplier (typed by them) will also not be acceptable to BHEL. The pre-printed form issued by BHEL shall be used for making the PBG.

K] Post-order submission of documents for approval

In the event of the release of Letter of Intent (LoI) / Purchase order/s (PO) against this tender, Bidders have to submit the applicable documents as called for in the tender / LoI / PO/s, such as drawings, data sheets, design calculations etc. These documents for approval have to be submitted within the agreed timelines between BHEL and Bidder. Normally the time period for submission for approval is 15 days from the date of receipt of the LoI / PO by the supplier. The actual time period within which the documents have to be submitted for approval would be specified in the LoI / PO.

Such documents would be subjected to evaluation and approval by BHEL and / or by BHEL's customer / Consultant / Customer's Consultant. Bidders have to give their specific acceptance for this.

After approval of such documents and after getting clearance from BHEL, only the items ordered can be taken up for manufacture.

Any changes required by BHEL / Customer etc. in the documents submitted for approval shall be incorporated by the Bidder and no extra cost would be payable by BHEL for such changes.

In the event that the Bidder does not carry out the required corrections, then the LoI / PO would be liable for cancellation by BHEL and BHEL would resort to alternate purchase action at the risk and cost of the Bidder under the Risk Purchase Condition of the Purchase Order.

Note: After receiving the LoI / PO, supplier shall also forward the acknowledgement / acceptance of the LoI / PO by signing and returning the second copy of the LoI / PO as the token of acceptance.

L] Others

a) In case of any contradiction in the terms and conditions given here and elsewhere in the other documents of the tender, it shall be the responsibility of the tenderer to get it clarified from BHEL. The officer authorized to provide such clarifications is the tender issuing officer.

b) Alterations to the conditions of the Tender can be done only by the authorized officer, at any time before the date and time of tender opening and would be duly communicated through a corrigendum.

c) Suspension of Business dealings with Suppliers:

(i) Before submitting offer, prospective bidders are advised to visit our web-site www.bhel.com / supplier registration to familiarize themselves with BHEL's policy and procedures of Suspension of Business Dealings with Suppliers.

Submission of offer shall be deemed to be evidence of the Bidder to have read and understood the above said policy.

ii) Treatment of Banned / Under-performing Vendors:

Any supplier who has been put on "Hold" or "Banned" from having business dealings with BHEL, Ranipet or any other unit of BHEL shall not submit their offer against this tender. If any such offers are received they would be summarily rejected and sent back. During the processing of tender, if any unit of BHEL puts a supplier on "Ban" then further processing of the offer will not be taken up and in case an order is placed, BHEL, Ranipet may resort at their discretion to cancel the PO either fully or partially.

If any of the supplier who is supplying similar material to BHEL, Ranipet has a Vendor Performance Rating (VPR) score of 'C' or below, then offer given by such parties will not be considered for ordering in this tender.

If any of the Bidders have unexecuted order/s with BHEL and if in such orders, the deliveries have been delayed beyond a reasonable period (say 30 days of agreed delivery period), the offer of such Bidders will also be liable for rejection.

Offers of such of those bidders against whom action for suspension of business dealings has been initiated by BHEL, Ranipet or any other Units/Division of BHEL will also not be considered in this tender.

d) Fraud Prevention Policy:

The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

e) Applicability of Integrity Pact:-

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. A panel of Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.



Sl	IEM	Address	Phone & Email
1.	Shri.D.R.S Chaudhary, IAS (Retd.)	E-1/164,Arera Colony Bhopal 462016 (M.P.)	dilip.chaudhary@icloud.com
2.	Shri Pravin Tripathi, IA & AS (Retd.)	D-243, Anupam Gardens, Lane IB, Sarai, Sainik Farms, New Delhi – 110 068.	pravin.tripathi@gmail.com

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.

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 the IEM(s).All correspondence with the IEMs shall be done through email only.

Note:

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

For all clarifications/ issues related to the tender, please contact:

Name: (1) (2)

Dep't:

Address:

.....

Phone:(Landline/Mobile) (1) (2)

Email:

Fax:

Integrity Pact are applicable for all the BHEL enquiries whose estimated value is equal to or more than Rupees 05 Crores.

Copy of Integrity Pact with applicable nominated IEM is attached along with the tender documents for ready reference of Suppliers.

f) If any Supplier attempts to bribe, or pay commission, gift or any advantage or bring in undue influence either by himself or on his behalf any one including a stranger to the tender, in addition to instituting legal proceedings as per the extant laws prevailing, will disqualify the supplier from this tender and all future tenders of BHEL. Decision of the Purchaser would be final in this matter.

g) The laws governing this transaction shall be the laws in India.

h) Wherever not specified, Inco terms 2010 shall be used to interpret the Commercial terms and conditions and

i) In the event of an order, Supplier shall agree to settlement of disputes or differences, if any, by way of arbitration, in accordance with the “Rule of Arbitration” of the Indian Council of Arbitration.

The language in the tender documents downloaded by the Bidders shall at no point of time be changed, altered or modified in any manner by the Tenderer. If such changes are made by any tenderer, it shall be considered as tampering with BHEL’s terms and the offer shall be summarily rejected, whenever it is noticed by BHEL. Such Bidders would be disqualified from the Bidding Process and their offers would be forfeited / Bank Guarantees invoked. They would also not be allowed to participate in future tenders of BHEL.

M. Conditions for rejection of offers:

Following is the list of situations which would lead to rejection of offer/s.

This list is not exhaustive but only indicative.

BHEL reserve the right to reject one or all offers without assigning any reason. The decision of BHEL will be final in this regard.

1. *If the offer fails to meet the technical requirements/specifications of the tendered item/s.*
2. *If the offer does not meet the commercial terms & conditions, such as but not limited to delivery period specified in the tender, Delivery terms, payment terms, Liquidated damages, Risk Purchase, cancellation clause etc., including the load factors specified in the tender.*
3. *If the bidder fails to respond to clarification sought, within a reasonable period. In case of doubts / lack of clarity on the technical and commercial offer of the bidder, BHEL will seek clarifications. Bidders are required to respond completely to such BHEL’s queries within 3 working days unless otherwise agreed to in writing by BHEL for period beyond 3 days. If supplier fails to respond within 3 working days or maximum 2 working days on a reminder thereon, the offer of such bidders will be automatically dis-qualified in the tender without further recourse to informing the bidder.*
4. *If any of the conditions listed below are applicable to the bidder, the offer is liable to be rejected:*

If any

- Debt recovery / Winding up Proceedings are initiated against the Company in Courts / Debt Recovery Tribunals (DRTs),
 - Proceedings are there against the Company in National Company Law Tribunal (NCLT) with respect to Insolvency and Bankruptcy Code (IBC) or otherwise,
 - Any proceedings are there against the Company under the “Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act,
 - Any restructuring proceedings are underway for the Company under Corporate Debt Restructuring (CDR), Strategic Debt Restructuring (SDR) or otherwise,
 - Divestment / demerger proceedings are underway for the Company under the Companies Act.
 - If action under guidelines of suspension of business dealings (Ref AA/MM/SB/01 Rev 02 dt 22.07.2016) and its latest revisions has been initiated against the company/bidder.
5. *Failure to sign & accept the Integrity Pact (where applicable). Bidders are hereby informed that the contents of the Integrity Pact are firm and fixed and cannot be changed.*

The above list is not exhaustive but is indicative only.

N. Special Note:

BHEL is a Government of India Undertaking. Its procurement practices are governed by the (Internal) Purchase Policy issued by the management of the company and as per Annexure B applicable at the time of finalising the order against this tender.

-O-

Record of Revisions:

Revision No.	Revision Date	Modification
01	17.08.2016	Payment terms for Foreign suppliers modified wrt loading- Clause k.ii
02	29.08.2016	Treatment of banned vendors – Para 3 added - Clause L.ii
03	14.09.2016	Opening of offers – clause B – sub clause ‘b’ included and existing clause ‘b’ renamed as ‘c’.
04	14.09.2016	Opening of offers – Note – sub clause (ii) modified
05	12.10.2016	Clause N. Special Note added
06	22.10.2016	Clause G Reverse Auction modified. Annexure on General Business Rules for Reverse Auction appended Role of Principals added under ‘Miscellaneous’
07	20.01.2017	Clause L (e) is modified. Clause L (f ,g ,h) renumbered.
08	24.02.2017	Clause F(c) modified.
09	08.07.2017	Clause M, Point 4 is added – regarding the financial health of the Bidder - as a criterion for disqualification.
10	20.07.2017	Duties and Taxes replaced with GST; Applicability of GST for LD inserted in Clause E; Treatment of poor performing current vendors inserted in clause L.c.(ii)
11	25.07.2017	Clause A.Note (iii) CST etc., replaced with GST; Clause C.f Deleted;
12	15.09.2017	Clause M, Point 5 inserted regarding Integrity Pact
13	21.03.2018	Clause A, Point xi inserted regarding Overwriting in Price Bids
14	28.05.2018	Clause A, a),b),c),d) amended for M/s E-Procurement technologies, https://bhel.abcprocure.com . Clause A, (f, g, h) – modified. Clause M, Point 4, - regarding suspension of business dealings inserted.
15	23.07.2018	Clause L,(e)- Applicability of Integrity Pact – modified.
16	31.08.2018	Clause C,(n)- Preference to Make in India – added.
17	04.12.2018	Clause C,(n)- Preference to Make in India & Clause K.2 Note - MSE concessions– modified.
18	13.02.2019	Clause C,(n)- Preference to Make in India – modified. Page no 9 Clause o – Extended credit period - removed.

ANNEXURE

Model General Business Rules for Reverse Auction

This has reference to tender no {tender number....date...}. BHEL shall finalise the Rates for the supply of {item name} through Reverse Auction mode. BHEL has made arrangement with M/s. {Service provider}, who shall be BHEL's authorized service provider for the same. Bidders should go through the instructions given below and submit acceptance of the same.

The technical & commercial terms are as per (a) BHEL Tender Enq. No. {...} dated {...}, (b) Bidders' technical & commercial bid (in case of two part bid) and (c) subsequent correspondences between BHEL and the bidders, if any.

1. Procedure of Reverse Auctioning

- i. Online Sealed Bid: This duration of online sealed bid will be {...} minutes. All bidders to submit their online sealed bids during this period.
- ii. Online Reverse Auction: The 'opening price' i.e. start price for RA and 'bid decrement' will be decided by BHEL.
- iii. If BHEL decides the lowest online sealed bid as the starting price, then the lowest bidder in online sealed bid shall be shown as current L1 automatically by the system and no acceptance of that price is required. System shall have the provision to indicate this bid as current L1.
- iv. Bidders by offering a minimum bid decrement or the multiples thereof can displace a standing lowest bid and become "L1" and this continues as an iterative process.
- v. After the completion of the online reverse auction, the Closing Price (CP) shall be available for further processing.

2. Schedule for Reverse Auction: The Reverse Auction is tentatively scheduled on {date}: and the duration of online sealed bid will be {...} minutes. All bidders to submit their online sealed bids during this period.

- Online Sealed Bid:-

- {Start Time:
- Close Time: }

- Online Reverse Auction:-

- {Start Time:
- Close Time: }

3. Auction extension time:

If a bidder places a bid in the last {...} minutes of closing of the Reverse Auction and if that bid gets accepted, then the auction's duration shall get extended automatically for another {...} minutes, for the entire auction (i.e. for all the items in the auction), from the time that bid comes in. Please note that the auto-extension will take place only if a bid comes in those last {...} minutes and if that bid gets accepted as the lowest bid. If the bid does not get accepted as the lowest bid, the auto-extension will not take place even if that bid might have come in the last {...} minutes. In case, there is no bid in the last {...} minutes of closing of Reverse Auction, the auction shall get closed automatically without any extension. However, bidders are advised not to wait till the last

minute or last few seconds to enter their bid during the auto-extension period to avoid complications related with internet connectivity, network problems, system crash down, power failure, etc.

The above process will continue till completion of Reverse Auction.

Complaints/ Grievances, if any, regarding denial of service or any related issue should be given in writing thru e-mail/ fax to M/s. {Service provider} with a copy to BHEL within 15 minutes prior to initial closing time of Online Reverse Auction.

4. Bid price: The Bidder has to quote the {.....} Price inclusive of Packing & Forwarding charges, all the routine & type tests as per tender scope, GST, Freight (bidder to provide original Freight paid receipt), insurance charges, etc. including loading (if indicated by BHEL due to deviations in technical/commercial terms) for the Items specified. Details are as shown in Excel Sheet for calculation of total cost to BHEL (To be specified by Unit as per NIT conditions).

5. Bidding currency and unit of measurement:

Bidding will be conducted in *Indian Rupees per Unit* of the material as per the specifications {...}

In case of foreign currency bids, exchange rate (TT selling rate of State Bank of India) as on scheduled date of tender opening (Part-I bid) shall be considered for conversion in Indian Rupees. If the relevant day happens to be a Bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken.

6. Validity of bids: Price shall be valid for {... days} from the date of reverse auction. These shall not be subjected to any change whatsoever.

7. Lowest bid of a bidder: In case the bidder submits more than one bid, the lowest bid at the end of Online Reverse Auction will be considered as the bidder's final offer to execute the work.

8. Bidders shall be assigned a Unique User Name & Password by M/s. {Service provider}. Bidders are advised to change the Password and edit the information in the Registration Page after the receipt of initial Password from M/s. {Service provider} to ensure confidentiality. All bids made from the Login ID given to the bidders will be deemed to have been made by the bidders/ bidders' company.

9. Post auction procedure: BHEL will proceed with the Lowest Bid in the Reverse Auction for further processing.

10. Any commercial/ technical loading shall be intimated to bidders prior to RA. The excel sheet provided in this regard shall cover all these aspects. Commercial/ technical loading if any, shall be added by the respective bidder in its price during online sealed bid & Online Reverse Auction. Modalities of loading & de-loading shall be separately intimated to the bidders. The responsibility for correctness of total cost to BHEL shall lie with the bidders.

11. Computerized reverse auction shall be conducted by BHEL (through M/s. {Service Provider}), on pre-specified date, while the bidders shall be quoting from their own offices/ place of their choice. Internet connectivity shall have to be ensured by bidders themselves.

During the RA process if a bidder is not able to bid and requests for extension of time by FAX/ email/ phone then time extension of additional 15 minutes will be given by the service provider provided such requests come before 5 minutes of auction closing time. However, only one such request per bidder can be entertained. Despite this extension if bidder fails to upload his prices due to extreme case of failure of Internet connectivity, (due to any reason whatsoever may be) it is the bidders' responsibility/ decision to send fax communication immediately to M/s. {Service provider}, furnishing the price the bidder wants to bid online with a request to the service provider to upload the faxed price online so that the service provider will upload that price online on behalf of the Bidder. It shall be noted clearly that the concerned bidder communicating this price to service provider has to solely ensure that the fax message is received by the service provider in a readable/ legible form and also the Bidder should simultaneously check up with service provider about the clear receipt of the price faxed. It shall also be clearly understood that the bidder shall be at liberty to send such fax communications of prices to be uploaded by the service provider only within the closure of Bid time and under no circumstance it shall be allowed beyond the closure of Bid time /reverse auction. It shall also be noted that the service provider should be given a reasonable required time by the bidders, to upload such prices online and if such required time is not available at the disposal of the Service provider at the time of receipt of the fax message from the bidders,

the service provider will not be uploading the prices and either BHEL or the service provider are not responsible for this unforeseen circumstances. In order to ward-off such contingent situation bidders are requested to make all the necessary arrangements/ alternatives whatever required so that they are able to circumvent such situation and still be able to participate in the reverse auction successfully. Failure of power or loss of connectivity at the premises of bidders during the Reverse auction cannot be the cause for not participating in the reverse auction. On account of this, the time for the auction cannot be extended and neither BHEL nor M/s. {Service provider} is responsible for such eventualities.

12. Proxy bids: Proxy bidding feature is a pro-bidder feature to safeguard the bidder's interest of any internet failure or to avoid last minute rush. The proxy feature allows bidders to place an automated bid in the system directly in an auction and bid without having to enter a new amount each time a competing bidder submits a new offer. The bid amount that a bidder enters is the minimum that the bidder is willing to offer. Here the software bids on behalf of the bidder. This obviates the need for the bidder participating in the bidding process until the proxy bid amount is decrementally reached by other bidders. When proxy bid amount is reached, the bidder (who has submitted the proxy bid) has an option to start participating in the bidding process.

The proxy amount is the minimum amount that the bidder is willing to offer. During the course of bidding, the bidder cannot delete or change the amount of a proxy bid. Bids are submitted in decrements (decreasing bid amounts). The application automates proxy bidding by processing proxy bids automatically, according to the decrement that the auction originator originally established when creating the auction, submitting offers to the next bid decrement each time a competing bidder bids, regardless of the fact whether the competing bids are submitted as proxy or standard bids. However, it may please be noted that if a manual bid and proxy bid are submitted at the same instant manual bid will be recognized as the L1 at that instant. In case of more than one proxy bid, the system shall bid till it crosses the threshold value of 'each lowest proxy bid' and thereafter allow the competition to decide the final L1 price. Proxy bids are fed into the system directly by the respective bidders. As such this information is privy only to the respective bidder(s).

13. Bidders are advised to get fully trained and clear all their doubts such as refreshing of screen, quantity being auctioned, tender value being auctioned etc. from M/s. {Service provider}.

14. M/s. {Service provider}, shall arrange to demonstrate/ train the bidder or bidder's nominated person(s), without any cost to bidders. M/s. {Service provider}, shall also explain the bidders, all the business rules related to the Reverse Auction. Bidders are required to submit their acceptance to the terms/ conditions/modalities before participating in the Reverse Auction in the process compliance form as enclosed. Without this, the bidder will not be eligible to participate in the event.

15. Successful bidder shall be required to submit the final prices (L1) in prescribed format (Annexure-VI) for price breakup including that of line items, if required, quoted during the Online Reverse Auction, duly signed and stamped as token of acceptance without any new condition (other than those already agreed to before start of auction), after the completion of auction to M/s. {Service provider} besides BHEL within two working days of Auction without fail.

16. Any variation between the final bid value and that in the confirmatory signed price breakup Document will be considered as tampering the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings (as available on www.bhel.com).

17. Bidders' bid will be taken as an offer to execute the work/ supplies of the item as per enquiry No. {...} dt. {...}. Bids once made by the bidder, cannot be cancelled/ withdrawn and bidder shall be bound to execute the work as mentioned above at bidder's final bid price. Should bidder back out and not execute the contract as per the rates quoted, BHEL shall take action as per extant guidelines for suspension of business dealings (as available on www.bhel.com).

18. Bidders shall be able to view the following on their screen along with the necessary fields during Online Reverse Auction:

- a. Leading (Running Lowest) Bid in the Auction (only total price of package).
- b. Bid Placed by the bidder.
- c. Start Price.



- d. Decrement value.
- e. Rank of their own bid during bidding as well as at the close of auction

19. BHEL's decision on award of contract shall be final and binding on all the Bidders.

20. BHEL reserves the right to extend, reschedule or cancel the Reverse Auction process at any time, before ordering, without assigning any reason, with intimation to bidders.

21. BHEL shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause. In such cases, the decision of BHEL shall be binding on the bidders.

22. Other terms and conditions shall be as per bidder's techno-commercial offers and other correspondences, if any, till date.

23. If there is any clash between this business document and the FAQ available, if any, in the website of M/s. {Service provider}, the terms & conditions given in this business document will supersede the information contained in the FAQs. Any changes made by BHEL/ service provider (due to unforeseen contingencies) after the first posting shall be deemed to have been accepted if the bidder continues to access the portal after that time..

24. Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines for suspension of business dealings (as available on www.bhel.com), shall be initiated by BHEL.



RA price confirmation and breakup
(To be submitted by L1 bidder after completion of RA)

To
- M/s. Service provider
- Postal address

CC: M/s BHEL

BOILER AUXILIARIES PLANT
INDIRA GANDHI INDUSTRIAL COMPLEX
RANIPET – 632406
TAMILNADU
INDIA.

Sub: Final price quoted during Reverse Auction and price breakup

Dear Sir,

We confirm that we have quoted.

Rs.{ _____ in value & in words _____ } for item(s) covered under tender enquiry
No. {...} dt.{...}

Total price of the items covered under above cited enquiries is inclusive of {Packing & forwarding, GST, freight and insurance charges up to {.....}
District,{.....} State and Type Test Charges etc., [exclusive of Goods & Services tax (GST)],
other as
per NIT}

as our final landed prices as quoted during the Reverse Auction conducted today {date} which will
be valid for a period of { ____ in nos. & in words ____ } days.

The price break-up including that of line items is as given below.

Total	=====
	- Rs.in value & in words
	=====

Thanking you and looking forward to the valuable order from BHEL.

Yours sincerely,
For _____
Name:
Company:
Date:
Seal:



Purchase, Materials Management,
Bharat Heavy Electricals Limited,
Boiler Auxiliaries Plant, Ranipet - 632 406, **INDIA.**
(A Government of India Undertaking)

GUIDELINES ON ACCEPTANCE OF BANK GUARANTEES GIVEN BY VENDORS

1. INTRODUCTION

As a part of the business operations, BHEL is taking Bank Guarantees from its Vendors/contractors/sub-contractors for various purposes. These Bank Guarantees are structured according to the terms of the Tender/ Agreement/ Contract.

2. TYPES OF BANK GUARANTEES TAKEN FROM VENDORS/CONTRACTORS/ SUB-CONTRACTORS BY BHEL

Generally, following types of Bank Guarantees are being taken by BHEL-

i. Bank Guarantees for Earnest Money Deposit

EMD is to be paid by tenderers for securing fulfilment of any obligations in terms of the NIT. In case of total EMD amount is more than Rs.20 lakh, the amount in excess of Rs.20 lakh may be accepted in the form of Bank Guarantee from scheduled bank. The Bank Guarantee in such cases shall be valid for atleast six months.

ii. Bank Guarantee (in lieu of Security Deposit):

Security Deposit is to be collected from the successful Bidder. In addition to other modes of furnishing Security Deposit, Bank Guarantee from Scheduled Banks can be submitted in lieu of Security Deposit by the contractors/sub-contractors/vendors, subject to the compliance with the provisions of Works Policy/Purchase Policy and/or Tender Conditions/ Extant Guidelines

iii. Bank Guarantee against Mobilization Advance/ Initial/ Milestone linked payment:

Normally, no advance payment shall be made to Contractor/ sub-contractors/vendors. Mobilization advance payment in exceptional circumstances shall be interest bearing and secured through Bank Guarantee/s and shall be limited to a maximum of 5% of the Contract Value. The Bank Guarantee shall be for 110% of the value of advance so as to enable recovery of not only principal but also the interest portion.

iv. Performance Bank Guarantee:

These Bank Guarantees may be taken as guarantee for successful performance/ completion of the Contract.

v. Bank Guarantee for Supply of Free Issue Material

BHEL Units sub-contract their jobs to Ancillaries and other fabricators by issuing materials free of cost on returnable basis. Though these fabricators are under contractual obligation to ensure safety of BHEL material and to return the same after carrying out the assigned job, to safeguard BHEL's interest, Bank Guarantee is to be taken in favour of BHEL.

vi Bank Guarantee (For release of Liquidated Damages Amount):

Sometimes, Bank Guarantee against release of Liquidated Damages (LD) is also being obtained by BHEL. In such cases, Bank Guarantee should be valid till the LD issues are settled.

(Compliance with the provisions of Works Policy/Purchase Policy and/or Tender Conditions/ Extant Guidelines may be ensured)

3. STANDARD FORMATS

The following standard format for Bank Guarantees for both Indian and foreign contractors/sub-contractors/vendors which can be used by the Units/Regions are enclosed-

- a. Proforma of Bank Guarantee for Earnest Money Deposit (**Annexure A**)
- b. Proforma of Bank Guarantee in lieu of Security Deposit (**Annexure B**)
- c. Proforma of Bank Guarantee (to secure Advance/ Initial/ Milestone linked payment) (**Annexure C**)
- d. Proforma of Bank Guarantee (Performance) / Contract Execution (**Annexure D**)
- e. Proforma of Bank Guarantee (For release of Liquidated Damages Amount) (**Annexure E**)
- f. Proforma of Bank Guarantee for Supply of Free Issue Material (**Annexure F**)

4. ACCEPTANCE OF BANK GUARANTEES ISSUED BY CONSORTIUM BANKS

List of Banks in BHEL's Consortium of Banks enclosed at **Annexure 1**. For getting Bank Guarantees issued in BHEL's favor preference shall be given to Consortium Banks. As such, Units should insist their contractors/sub-contractors/vendors to submit Bank Guarantees issued by any of the BHEL's Consortium Banks. Therefore, the List of the Consortium Banks along with the Standard Bank Guarantee Format (forming part of these Guidelines) should also form part of the Tender/ Contract document issued by BHEL. (Units may regularly check Corporate Finance- FSD Site (<http://intranet.bhel.in/FSD>) for updated List of Consortium Banks).

5. ACCEPTANCE OF BANK GUARANTEES ISSUED BY NON-CONSORTIUM BANKS

In case any contractors/sub-contractors/vendors expresses difficulty in obtaining Bank Guarantees from any of the BHEL's Consortium Banks and offer to submit Bank Guarantee from any other Nationalized/Public Sector/Private Sector/Foreign Banks, the same may be accepted subject to the following conditions-

A. NETWORTH OF THE BANK ISSUING THE BANK GUARANTEE

- i. In respect of Banks having Net Worth below Rs.500 crores- Exposure Limit is NIL.
- ii. In respect of Banks having Net Worth between Rs.500 to Rs. 2000 crores (As per Latest Annual Report)-The overall exposure limit (at the Unit/Region Level) should not exceed Rs.10 crores for all the non-Consortium Banks put together.
- iii. In respect of Banks having Net Worth above Rs. 2000 crores (As per Latest Annual Report)-The overall exposure limit (at the Unit/Region Level) should not exceed Rs.30 crores for all the non-Consortium Banks put together.

Units/ Regions may insist their contractors/sub-contractors/vendors to provide a Certificate from the concerned Bank along with a Copy of latest Annual Report as supporting documents for Net Worth of the Bank. Additionally, in case required, the figure for Net Worth may be cross checked with the Corporate Office/ Head Office of the concerned Bank. In case, the abovementioned limits have already been exhausted or sufficient balance is not available, the same may be intimated suitably to the contractors/sub-contractors/vendors beforehand.

B. TYPE OF BANKS ISSUING THE BANK GUARANTEE

- i. Bank Guarantee submitted by domestic contractors/sub-contractors/vendors from non-consortium banks-
 1. **Nationalized/ other Public Sector Banks:** Bank Guarantees issued by Nationalized/ other Public Sector Banks (which are not in BHEL's Consortium) can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city in which the Unit is located. i.e. Demand can be presented at the Branch located in the town/city in which the Unit is located.
 2. **Private Sector Banks:** Bank Guarantees issued by Private Sector Banks (which are not in BHEL's Consortium) can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city in which the Unit is located i.e. Demand can be presented at the Branch located in the town/city in which the Unit is located. However, Units may prefer Nationalized/Public Sector Banks over Private Sector Banks in respect of Bank Guarantees issued by non-consortium banks.

3. **Foreign Banks (BG issued by Branches in India):** Bank Guarantees issued by Foreign Banks (which are not in BHEL's Consortium) can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.

4. **Bank Guarantees submitted by Foreign Vendors**

- a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks which are not in BHEL's Consortium (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
- b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor Country's Bank)**
- b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by any **of the Consortium Banks** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank (BHEL's Consortium Bank). **It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.**
- b.2 In case, **Foreign Vendors intend to provide BG from Overseas Branch** of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
- b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). In case, of Foreign Vendors, the BG Format provided to them should clearly specify the same.

C. Co-Operative Banks/ Financial Institutions: Bank Guarantees issued by Co-Operative Banks/ Financial Institutions is **not to be accepted** under all circumstances.

6. **OTHER IMPORTANT ISSUES-**

- i) **BG Text Related Issues-** Bank Guarantees should be clear and precise and should clearly specify the following:
1. The name and address of the applicant i.e Vendor
 2. The name and address of the beneficiary i.e BHEL. It must be ensured that the concerned Unit's name is clearly mentioned in the Bank Guarantee.
 3. The name and address of the guarantor Bank and Branch
 4. A reference number or other information identifying the underlying contract
 5. A reference number or other information identifying the issued guarantee.
 6. The amount or maximum amount payable and the currency in which it is payable
 7. The validity period/date of expiry of the guarantee including Claim period
 8. Claim is payable without demur, protest or proof and merely on demand from BHEL. BG should be unconditional
 9. It should clearly specify the place of Invocation
 10. Presently, there is no legal requirement for getting signatures of Witnesses on the Bank Guarantees. Therefore, BHEL may not insist for the same.
 11. In case of cutting/ overwriting on the Bank Guarantee have been properly authenticated under signature and seal of the executing Bank.

ii) Confirmation of genuineness/authenticity of the Bank Guarantee

Following safeguards in respect of all Bank Guarantees (including Extensions/ Amendments) issued by any of the Banks (including Consortium Banks) are required to be taken ñ

- a. The prescribed format in which BGs are acceptable from the contractors/sub-contractors/vendors may be formed part of the tender document. On receipt of the Original Bank Guarantee by BHEL, the same may be verified verbatim with the Bank Guarantee format provided by BHEL.

- b. **Use of Structured Financial Messaging System (SFMS) for Sending and receiving Bank Guarantee Instruments**

Structured Financial Messaging System (SFMS) has been/ is being implemented by the Banks as per the Ministry of Finance's instructions for Sending and receiving Bank Guarantee and also Inland Letter of Credit Instruments. The SFMS provides a platform for secure communication within the Bank and between Banks. As such, SFMS can prove to be an excellent IT enabled platform for getting secure confirmations from the Banks in respect of Bank Guarantees issued in favor of BHEL. Therefore, Units should insist the contractors/sub-contractors/vendors to provide the Bank Guarantees from Banks which are already SFMS Compliant.

Under SFMS System, a separate advice of the Bank Guarantee (via SFMS IFN 760COV) to be sent to the Advising bank (Beneficiary's Bank) through SFMS by the Issuing Bank (Applicant's Bank), after which the paper Bank Guarantee would become operative. Similar process to be followed for bank guarantee amendment also and separate advice (via SFMS IFN 767COV) is sent to the Advising Bank. It must be ensured that the Issuing and Advising Bank must be SFMS enabled. The details of Advising Bank / Beneficiary Bank (i.e. IFSC Code & Branch address) have to be provided to the BG issuing Bank along with the application for the Application/Request for issuance of Bank Guarantee.

At the time of application for issuance of a Bank Guarantee, the applicant has to furnish Beneficiary's Bank Branch IFSC, Branch Name and address to the Issuing Bank. In this regard, details of those Banks in BHEL's Consortium may be provided to the contractors/sub-contractors/vendors which have waived Advising Charges for advising the Bank Guarantees (where BHEL is beneficiary) through SFMS. Corporate Office will share the details of those Banks from time to time

- c. In case, any contractors/sub-contractors/vendors show their inability to submit the Bank Guarantee from Issuing Bank which is SFMS Compliant, Units may accept paper Bank Guarantee sent to BHEL directly by the issuing Bank under Registered Post (A.D) /Speed Post/Courier/By Hand. However, a declaration as to List of Vendor Banks along with a confirmation that none of their Banks are SFMS compliant may be obtained. Such a requirement shall be clearly specified in the Tender Document/ Contract
- d. In exceptional cases, BGs received through the contractors/sub-contractors/vendors can be accepted. When a Bank Guarantee is directly received through the contractors/sub-contractors/vendors, the Issuing Branch should be requested to immediately send a confirmation that the said Bank Guarantee has been issued by them or send by Registered Post (A.D) an unstamped duplicate copy of the Bank Guarantee directly to BHEL with a Covering Letter. This will enable BHEL to compare the same with the original BG and ensure that the same is in order.
- e. **Further Verification in respect of Bank Guarantees not advised through SFMS**
As an additional measure of abundant precaution, all the Bank Guarantees received (not advised through SFMS) should be independently verified by BHEL and on receipt of the Original Bank Guarantee, the Issuing Bank may be requested to provide-
 - 1. Immediate Confirmation over email.

2. The possibility of getting confirmation through digitally signed secured emails from issuing Banks may be explored.
3. Thereafter, Banker may be requested to either provide the Confirmation Letter stating that the said Bank Guarantee has been issued by them and signed by their authorized employees in line with the financial authority/ powers given to these employees, or send by Registered Post (A.D) an unstamped duplicate copy of the Bank Guarantee directly to BHEL with a Covering Letter. Further, a confirmation may be obtained from the Bank that Bank Guarantee has been issued on a Stamp Paper of appropriate value.

All efforts shall be made by the Unit to obtain the confirmation as above within 10 days of receipt of the Bank Guarantees by BHEL.

f. **Additional Safe-guards for all Bank Guarantees (including advised through SFMS)**

The following additional safeguards may please be taken care at the Unit/ Region level in respect of all Bank Guarantees (including Extensions/ Amendments) issued by any of the Banks (including Consortium Banks) to ensure protection of BHEL's interest-

1. Stamp paper related ñ

- a. Wherever, e-stamping has been made compulsory, it is to be ensured that the Bank Guarantees has been issued in serially numbered security forms/ e-stamping. Verification of e-stamp can be done on-line <http://www.shcilestamp.com> (STOCK HOLDING CORPORATION OF INDIA LIMITED (SHCIL)).

An e-Stamp can be verified online by clicking on verify e-Stamp certificate and entering the following details-

- 1.State
- 2.Certificate Number (UIN)
3. Stamp Duty Type (Description of Document)
4. Certificate Issue Date

- b. The BG Should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG is executed, whichever is higher.

- c. To ensure that the Stamp Paper is issued in the name of the Issuing Bank or in the name of the Contractor/sub-contractor/ vendor.

2. To ensure that the Bank Guarantees has been issued in serially numbered security forms.
3. As per RBI Guidelines, all Bank guarantees issued for Rs.50,000/- and above should be signed by two officials jointly. Further, the name, designation and code numbers of the officer/officers signing the guarantees should be mentioned under the signature(s) of officials signing the bank guarantee.

- g. **Authorized Officials for dealing with Banks in respect of Bank Guarantees-** Units/Regions to assign responsibility for verification, timely renewal and timely encashment/ invocation of the Bank Guarantees to one or more Finance Executives depending upon the volume of work at the Unit/Region. **All correspondence with the Banks for matters related to Bank Guarantees are required to be carried out by Finance executives only**

iii) **Other issues**

a. **Addition of jurisdiction Clause in the Bank Guarantee-**

If required, Units/ Region may include the following jurisdiction Clause for dispute resolution at local level

" Any claim or dispute arising under the terms of this-Guarantee shall be-subject to the exclusive jurisdiction of-the court at _____ (Unit or HQ Location for ex. in case of PSWR - "Nagpur" /PSNR- Delhi, PSER- Kolkata/ PSSR0-Chennai) only.

However, it may be noted that the exclusive jurisdiction can form a part of the Bank Guarantee formats but it has to be seen that the Court upon whom the exclusive jurisdiction is being conferred must otherwise have jurisdiction for this clause to be effective under law.

iv) Safe Custody of Bank Guarantees-

Following steps may be taken by the concerned Finance Officials to ensure safety of Bank Guarantees-

1. Safe custody of the Bank Guarantees shall be the responsibility of Finance executive(s)
2. On receipt of the Bank Guarantee, the complete details of the Bank Guarantee should be entered in BG Register (physical register and also in separate file in soft form) **(As per Format at Annexure 2)** maintained centrally at the Unit/ Region/site. The data entered in the Register should be duly verified by the concerned official/officials.
3. Periodic physical verification and reconciliation of the Paper Bank Guarantees should be done with the BG Register.
4. Original Bank Guarantees including Extensions must be kept in safe Custody in **“Fire Proof”** Cabinets/ Cash Chests.

v) Long Duration Bank Guarantees

In case of Long Duration Bank Guarantees, it is advisable that only Bank Guarantees with validity for full period of the contract may be accepted by BHEL.

vi) Expiry Period and Claim Period

It may be ensured that the Expiry/Validity date and Claim date mentioned in the Bank Guarantee is in line with the Contract with the vendor.

Further, there should be an adequate gap, preferably 3-6 months, in the Expiry date and Claim Period so as to ensure that sufficient time is available with BHEL to submit Invocation Claim, if required under the Bank Guarantee. BHEL can claim the amount from the bank for the act which has happened before the validity (expiry) date but within the claim period. However, it is advisable that the Invocation Claim may be submitted within the Expiry date.

In this regard, it is to be noted that unless the Bank receives a written claim or demand on or before the Expiry date (in case there is no separate claim date) or Claim date (in case both Expiry date and claim date are included in the text) mentioned in the Bank Guarantee, all the rights of BHEL under the Bank Guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under the said Bank Guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

vii) Extension of the Bank Guarantee-

In case of non-fulfillment or non-completion of the Contractual Commitments by the concerned contractor/sub-contractor/vendor, action for extension of the validity of the Bank Guarantee should be taken atleast 60 days before the Expiry date and in accordance with the terms and conditions of the Bank Guarantee. Commercial/Executing Agency/Construction Manager of the Unit/Region/site concerned should intimate the custodian i.e. Unit's Finance of the Bank Guarantees sufficiently in advance for the action to be taken for Extension of the Bank Guarantee. In case, no response is received by Unit's Finance 60 days before the Expiry Date from the concerned Commercial/Executing Agency/Construction Manager, the concerned Finance Official may take action for extension to ensure that BHEL's interest is safeguarded.

In this regard following points are required to be ensured-

- a. Request for Extension of the validity is to be lodged atleast 60 days before the Expiry Date mentioned in the Bank Guarantee.
- b. The letter seeking extension should be addressed to the contractor/sub-contractor/vendor as the extension is normally done by the Bank on the request of the Applicant (Contractor/sub-contractor/Vendor). The same should be sent through Registered Post with A.D/ Speed Post. Courier/By hand with a copy to the Issuing Bank with a request to invoke Bank Guarantee in case the same is not extended before expiry date and this should be treated as a Provisional Claim.
- c. Regular follow-up with the contractor/sub-contractor/vendor through email/FAX for extension of BG need to be ensured.

- d. In case the extension of the validity is not done 15 days before the expiry date, immediate action for Invocation of the Bank Guarantee should be taken by sending Final Invocation Claim to the Issuing Bank at the place of issue or such other place as is specified in the guarantee with a copy to the contractor/sub-contractor/vendor. All provisions in respect of Invocation Claim as per **Para viii** is required to be followed

viii) Invocation Claim

In event of Breach by the contractor/sub-contractor/vendor (s) of the terms and conditions of said Contract or failure of the contractor/sub-contractor/vendor to perform the said Contract for which the Bank Guarantee has been given or in case of failure of the contractor/sub-contractor/vendor to extend the validity of the Bank Guarantee (as per Para vii), the concerned Unit shall take immediate action for lodgment of Claim with the Issuing Bank's Branch for Invocation of Bank Guarantees. Commercial/Executing Agency/Construction Manager of the Unit/Region/site concerned should intimate the custodian of the Bank Guarantees sufficiently in advance for the action to be taken for invocation of the Bank Guarantee.

In this regard, following points may please be ensured-

- a. Invocation Claim is to be lodged well before the Expiry date (in case there is no separate claim date) or Claim date (in case both Validity date and claim date are included in the text) mentioned in the Bank Guarantee.
- b. Invocation Claim is to be typed on BHEL Letter Head with full Postal Address of BHEL's Unit. It should also contain contact details of BHEL's dealing official.
- c. Invocation Claim is to be sent at the place of issue or such other place as is specified in the guarantee. Correctness of Issuing Bank's Address may be ensured before sending the Invocation Claim.
- d. The scanned copy of the Invocation letter may be sent immediately through email followed by sending the Invocation letter by Speed Post/ Registered Post (with Acknowledgement Card)/ By Hand (to be got personally acknowledged) to ensure timely receipt by the Bank's Branch mentioned in the Bank Guarantee. The Acknowledgement/Receipts should be positively obtained and the same should be preserved as evidence of sending Invocation Claim well in time. Confirmation of receipt of the Invocation Letter may be obtained through email or over phone.
- e. Invocation letter should clearly specify the Bank Guarantee Number.
- f. A demand may be made for an amount less than the full amount available (partial demand). Further, more than one demand (multiple demands) upto the total value of Bank Guarantee may be made by BHEL within the validity period. **However, it may be ensured that demand should not be made for more than the amount available under the guarantee as the Bank will consider it a non-complying demand and may not act on the same.**
- g. **It may be noted that Banks, as per the regulations, are required to promptly honour the guarantees issued by them as and when Bank Guarantees are invoked in accordance with the terms and conditions of the guarantee deeds. Payment should be made to the beneficiaries without delay and demur.**

Under a Bank Guarantee, the Bank undertakes to pay to the beneficiary, any money so demanded notwithstanding any dispute or disputes raised by the of the contractor/sub-contractor/vendor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto and the Banks liability is absolute and unequivocal. As such, the Banks cannot delay and deny honoring the invocation Claim.

Therefore, all steps should be taken to ensure timely payment by the Bank.

- h. In case, the Bank does not act and pay within three working days from the date of presentation of Final Claim/ Demand, the matter may be immediately escalated to the Regional Office of that Bank's Branch and thereafter to their Head Office under intimation to Corporate Office. In case of no response, matter may be referred to Ombudsman, RBI etc.

- i. After one month, if the amount is still not paid, unit may consider filling a legal case against the bank **in consultation with the Corporate Law Department.**

(Formats for Extension Letter /Invocation Claims are as per Format at Annexure G (1ST Letter), Annexure H (Reminder Letter), Annexure I (Final Claim/Invocation Letter) and Annexure J (Invocation Letter))

ix) Return of Bank Guarantee

a. After Expiry Period

The Expired Bank Guarantees which are not further required by BHEL due to fulfillment of the Contractual Commitments by the concerned of the contractor/sub-contractor/vendor may be returned to the concerned Bank under intimation to the Vendor/Contractor within 3 months from the date of expiry after ensuring completion of all the activities. The same is to be done on the specific recommendation/ approval of Commercial/Executing Agency/Construction Manager of the Unit/Region/site concerned.

b. Within Validity Period

In case, any Bank Guarantee is to be returned by BHEL due to fulfillment of the Contractual Commitments by the concerned of the contractor/sub-contractor/vendor within its validity period, the same has to be done on the specific recommendation/ approval of Commercial/Executing Agency/Construction Manager of the Unit/Region/site concerned after performing due-diligence.

x) Use of software

For timely and automatic alert in respect of Bank Guarantees due for expiration, use of software application is advisable. In case, the software is not available at a Unit, the same may be developed in a time bound manner.

PROFORMA OF BANK GUARANTEE FOR EARNEST MONEY
(On non-Judicial paper of appropriate value)

Bank Guarantee No.....

Date.....

To

(Employer's Name and Address)
.....

Dear Sirs,

In accordance with the terms and conditions of Invitation for Bids/Notice Inviting Tender No.....1(Tender Conditions), M/s. having its registered office at2 (hereinafter referred to as the 'Tenderer'), is submitting its bid for the work of.....3 invited by4.(name of the Employer) through its Unit at(

The Tender Conditions provide that the Tenderer shall pay a sum of Rs as Earnest Money Deposit in the form therein mentioned. The form of payment of Earnest Money Deposit includes Bank Guarantee executed by a Scheduled Bank.

In lieu of the stipulations contained in the aforesaid Tender Conditions that an irrevocable and unconditional Bank Guarantee against Earnest Money Deposit for an amount of5 is required to be submitted by the Tenderer as a condition precedent for participation in the said Tender and the Tenderer having approached us for giving the said Guarantee,

we, the[Name & address of the Bank]
..... having our Registered Office at(hereinafter referred to as the Bank) being the Guarantor under this Guarantee, hereby irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer without any demur, merely on your first demand any sum or sums of Rs. 5(in words Rupees.....) without any reservation, protest, and recourse and without the beneficiary needing to prove or demonstrate reasons for its such demand.

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

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor/Contractor/Vendors in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

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

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

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

This Guarantee shall be irrevocable and shall remain in force upto and including _____ and shall be extended from time to time for such period as may be desired by the Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Tenderer but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms hereof. However, unless a demand or claim under this Guarantee is made on us in writing on or before the _____ we shall be discharged from all liabilities under this Guarantee.

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

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed _____
- b) This Guarantee shall be valid up to _____
- c) Unless the Bank is served a written claim or demand on or before _____⁷ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank

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

For and on behalf of

(Name of the Bank)

Date _____

Place of Issue _____

¹ Details of the Invitation to Bid/Notice Inviting Tender

² Name and Address of the Tenderer

³ Details of the Work

⁴ Name of the Employer

⁵ BG Amount in words and Figures

⁶ Validity Date

⁷ Date of Expiry of Claim Period

Notes:

1. Units are advised that expiry of claim period may be kept 3-6 months after validity date. It may be ensured that the same is in line with the agreement/ contract entered with the Vendor.
2. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Contractor/sub-contractor /vendor/ Bank issuing the guarantee.
3. In line with the GCC, SCC or contractual terms, Unit may carry out minor modifications in the Standard BG Formats. If required, such modifications may be carried out after taking up appropriately with the Unit/Region's Law Deptt.

4. In Case of Bank Guarantees submitted by Foreign Vendors-

- a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
- b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**
 - b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
 - b.2 **In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank** (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
 - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). The BG Format provided to them should clearly specify the same.

PROFORMA OF BANK GUARANTEE (in lieu of SECURITY DEPOSIT)

In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____¹ through its Unit at _____ (name of the Unit) having agreed to exempt (Name of the Vendor / Contractor / Vendors) with its registered office at _____² (hereinafter called the said "Contractor" which term includes vendors), from demand under the terms and conditions of the Contract reference No. _____ dated _____³ valued at Rs. _____⁴ (Rupees -----)⁴ (hereinafter called the said Contract), of Security Deposit for the due fulfilment by the said Contractor of the terms and conditions contained in the said Contract, on production of a Bank Guarantee for Rs. _____⁵ (Rupees _____ only),

we _____ (indicate the name and address of the Bank) having its Head Office at _____ (address of the head Office) (hereinafter referred to as the Bank), , at the request of _____ [Contractor(s)], being the Guarantor under this Guarantee, do hereby irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer, , an amount not exceeding Rs. _____ without any demur, immediately on demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand

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

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) in any suit or proceeding pending before any Court or Tribunal or Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

The payment so made by us under this guarantee shall be a valid discharge of our liability for payment hereunder and the Contractor(s) shall have no claim against us for making such payment.

We, further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied & the Employer certifies that the terms and conditions of the said Contract have been fully and properly carried out by the said contractor(s) or acceptance of the final bill or discharge of this guarantee by the Employer, whichever is earlier. This guarantee shall initially remain in force upto and including _____⁶ and shall be extended from time to time for such period as may be desired by the Employer. Unless a demand or claim under this guarantee

is made on us in writing on or before the _____⁷, we shall be discharged from all the liability under this guarantee thereafter.

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

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

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

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

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed _____⁵
- b) This Guarantee shall be valid up to _____⁶
- c) Unless the Bank is served a written claim or demand on or before _____⁷ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

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

Date _____ Day of _____
for _____ (indicate the name of the Bank) _____

(Signature of Authorised signatory)

¹ ADDRESS OF THE EMPLOYER. I.e Bharat Heavy Electricals Limited

² ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER .

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ CONTRACT VALUE

⁵ BG AMOUNT IN FIGURES AND WORDS

⁶ VALIDITY DATE

⁷ DATE OF EXPIRY OF CLAIM PERIOD

Note:

1. Units are advised that expiry of claim period may be kept 3-6 months after validity date. It may be ensured that the same is in line with the agreement/ contract entered with the Vendor.
2. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Contractor/Supplier /Bank issuing the guarantee.
3. In line with the GCC, SCC or contractual terms, Unit may carry out minor modifications in the Standard BG Formats. If required, such modifications may be carried out after taking up appropriately with the Unit/Region's Law Deptt.

4. In Case of Bank Guarantees submitted by Foreign Vendors-

- a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
- b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**
 - b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
 - b.2 **In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank** (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
 - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). The BG Format provided to them should clearly specify the same.

BANK GUARANTEE FOR ADVANCE

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of Bharat Heavy Electricals Limited¹ (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____¹ through its Unit at _____ (name of the Unit) having awarded to _____² (Name of the Vendor / Contractor / Supplier), with its registered office at _____² (hereinafter called "the Vendor/Contractor/Supplier" which expression shall include its successors and permitted assigns) a contract Ref No _____ dated _____³ valued at Rs _____ (Rupees -----) / FC _____ (in words _____) for _____⁴ (hereinafter called the 'Contract')

AND WHEREAS the Employer has agreed to advance to the Vendor/Contractor/Supplier, a sum of Rs _____ (Rupees _____ only), equivalent to _____% of the said value of the Contract (hereinafter called "the said Advance"), upon the condition, that the said Advance shall be secured by a guarantee for Rs/ FC ----- (Rupees/ FC -----)⁵ from a Bank as hereinafter appearing.

We, _____, (hereinafter referred to as the Bank), having registered/Head office at _____ and a branch at _____ being the Guarantor under this Guarantee, hereby irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer any sum or sums upto a maximum amount but not exceeding Rs/FC ----- (Rupees/FC -----) without any demur, merely on your first demand and without any reservation, protest and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

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

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor/Contractor/Supplier in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

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

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

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

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

This Guarantee shall remain in force upto and including _____⁶ and shall be extended from time to time on the request of the Employer for such period as may be desired by the Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Vendor/Contractor/Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms hereof. However, unless a demand or claim under this Guarantee is made on us in writing on or before the _____⁷ we shall be discharged from all liabilities under this Guarantee.

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

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed _____⁵
- b) This Guarantee shall be valid up to _____⁶
- c) Unless the Bank is served a written claim or demand on or before _____⁷ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank

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

For and on behalf of
(Name of the Bank)

Date _____.

Place of Issue _____.

¹ NAME AND ADDRESS OF THE EMPLOYER. i.e Bharat Heavy Electricals Limited

² NAME AND ADDRESS OF VENDOR /CONTRACTOR / SUPPLIER

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ CONTRACT VALUE AND PROJECT/SUPPLY DETAILS

⁵ BG AMOUNT IN FIGURES AND WORDS

⁶ VALIDITY DATE

⁷ DATE OF EXPIRY OF CLAIM PERIOD

Note:

1. Units are advised that expiry of claim period may be kept 3-6 months after validity date. It may be ensured that the same is in line with the agreement/ contract entered with the Vendor.
2. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Contractor/Supplier /Bank issuing the guarantee.
3. In line with the GCC, SCC or contractual terms, Unit may carry out minor modifications in the Standard BG Formats. If required, such modifications may be carried out after taking up appropriately with the Unit/Region's Law Deptt.
4. In exceptional circumstances where advance payment is to be made to a vendor and the Unit has contractually agreed with the Contractor/ Vendor for periodic reduction in Advance Bank Guarantee, if required the following clause may be added in the BG Text-

ôThe liability under this Guarantee shall stand reduced proportionally on periodic basis, in accordance with the value of effected shipment/dispatches/services completed on written confirmation by BHEL.ô

5. In Case of Bank Guarantees submitted by Foreign Vendors-

- a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
- b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**
 - b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter-Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It is advisable that all charges for issuance of Bank Guarantee/ counter-Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
 - b.2 **In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank** (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
 - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). The BG Format provided to them should clearly specify the same.

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____¹ through its Unit at _____ (name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) with its registered office at _____² hereinafter referred to as the 'Vendor / Contractor / Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No _____ dated _____³ valued at Rs _____⁴ (Rupees -----)/FC _____ (in words _____) for _____⁵ (hereinafter called the 'Contract') and the Vendor / Contractor / Supplier having agreed to provide a Contract Performance Bank Guarantee, equivalent to _____ % (_____ . Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

we, _____, (hereinafter referred to as the Bank), having registered/Head office at _____ and inter alia a branch at _____ being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer any sum or sums upto a maximum amount of Rs -- -----⁶ (Rupees -----) without any demur, immediately on first demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

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

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor / Contractor / Supplier in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

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

We the _____ bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract/satisfactory completion of the performance guarantee period as per the terms of the Contract and that it shall continue to be enforceable till

all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

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

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

This Guarantee shall remain in force upto and including _____⁷ and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Vendor / Contractor / Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the _____⁸ we shall be discharged from all liabilities under this guarantee thereafter.

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

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed _____⁶
- b) This Guarantee shall be valid up to _____⁷
- c) Unless the Bank is served a written claim or demand on or before _____⁸ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

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

For and on behalf of
(Name of the Bank)

Dated _____.

Place of Issue _____.

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

² NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ CONTRACT VALUE

⁵ PROJECT/SUPPLY DETAILS

⁶ BG AMOUNT IN FIGURES AND WORDS

⁷ VALIDITY DATE

⁸ DATE OF EXPIRY OF CLAIM PERIOD

Note:

1. Units are advised that expiry of claim period may be kept 3-6 months after validity date. It may be ensured that the same is in line with the agreement/ contract entered with the Vendor.
2. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Contractor/Supplier /Bank issuing the guarantee.
3. In line with the GCC, SCC or contractual terms, Unit may carry out minor modifications in the Standard BG Formats. If required, such modifications may be carried out after taking up appropriately with the Unit/Region's Law Deptt.

4. In Case of Bank Guarantees submitted by Foreign Vendors-

- a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
- b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**
 - b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
 - b.2 **In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank** (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
 - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). The BG Format provided to them should clearly specify the same.

BANK GUARANTEE FOR RELEASE OF AMOUNTS WITHHELD/LIQUIDATED DAMAGES AMOUNT

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of the Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____¹ through its Unit at _____ (name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) incorporated under the _____ having its registered office at _____² (hereinafter referred to as the 'Vendor/Contractor/Supplier' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No _____ dated _____³ valued at Rs _____ (Rupees _____)/FC _____ (in words _____) for _____⁴ (hereinafter called the 'Contract')

And Whereas the Vendor/Contractor/Supplier as per Contract should have completed the work/ supplies under the contract by _____ (date)

And Whereas as per terms and conditions of the Contract, the Employer is entitled to levy Liquidated Damages (LD) for delays/ shortfall in performance and the Employer has withheld an amount of Rs _____ by way of LD as per the Contract.

Now, on the request of the Vendor/Contractor/Supplier the Employer having agreed to release the amount of Rs _____ withheld from the Vendor's/Contractor's/Supplier's invoices as Liquidated damages under the terms and conditions of the Contract on production of a Bank Guarantee for Rs. _____ (Rupees _____ only).⁵

We, _____, (hereinafter referred to as the Bank), having registered/Head office at _____ and inter alia a branch at _____ being the Guarantor under this Guarantee, hereby irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer a maximum amount of Rs _____ (Rupees _____) without any demur, merely on a demand from the Employer and without any reservation, protest and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

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

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor/Contractor/Supplier on any suit or proceeding pending before any Court or Tribunal Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

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

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

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

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

This Guarantee shall remain in force upto and including _____⁶ and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Vendor/Contractor/Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the _____⁷ we shall be discharged from all liabilities under this guarantee thereafter.

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

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed _____⁵
- b) This Guarantee shall be valid up to _____⁶
- c) Unless the Bank is served a written claim or demand on or before _____⁷ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

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

For and on behalf of
(Name of the Bank)

Dated _____.

Place of Issue _____.

¹ NAME AND ADDRESS OF THE EMPLOYER I.e Bharat Heavy Electricals Limited.

² NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ CONTRACT VALUE AND PROJECT/SUPPLY DETAILS

⁵ BG AMOUNT IN FIGURES AND WORDS

⁶ VALIDITY DATE

⁷ DATE OF EXPIRY OF CLAIM PERIOD

Note:

1. Units are advised that expiry of claim period may be kept 3-6 months after validity date. It may be ensured that the same is in line with the agreement/ contract entered with the Vendor.
2. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Contractor/Supplier /Bank issuing the guarantee.
3. In line with the GCC, SCC or contractual terms, Unit may carry out minor modifications in the Standard BG Formats. If required, such modifications may be carried out after taking up appropriately with the Unit/Region's Law Deptt.

4. In Case of Bank Guarantees submitted by Foreign Vendors-

- a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
- b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**
 - b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
 - b.2 **In case, Foreign Vendors intend to provide BG from Overseas Branch** of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
 - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). The BG Format provided to them should clearly specify the same.

BANK GUARANTEE FOR SUPPLY FREE ISSUE MATERIAL

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of Bharat Heavy Electricals Limited¹ (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____¹ through its Unit at _____ (name of the Unit) having awarded to _____² (Name of the Vendor / Contractor / Supplier), with its registered office at _____² (hereinafter called "the Vendor/Contractor/Supplier" which expression shall include its successors and permitted assigns) a contract Ref No _____ dated _____³ valued at Rs _____ (Rupees -----) / FC _____ (in words _____) for _____⁴ (hereinafter called the 'Contract')

AND WHEREAS the Employer having agreed as per the terms and conditions of the Contract to supply free issue material costing Rs. _____ for the manufacture/fabrication of the equipment at the 'Contractor/Supplier/Fabricator's' site on furnishing of a Bank Guarantee for Rs./FC _____ (Rupees/FC _____) in the manner hereinafter specified for the due safeguard of the free issue material, we, _____, (hereinafter referred to as the Bank), having registered/Head office at _____ and inter alia a branch at _____ being the Guarantor under this Guarantee, hereby irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer any sum or sums upto a maximum amount but not exceeding Rs/FC _____ (Rupees/FC -----) without any demur, merely on a demand from the Employer and without any reservation, protest and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

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

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the 'Contractor/Supplier/Fabricator' in any suit or proceeding pending before any Court or Tribunal or Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment hereunder and the 'Contractor/Supplier/Fabricator' shall have no claim against us for making such payment.

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

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

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

This Guarantee shall remain in force upto and including _____⁶ and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor/ Supplier/ Fabricator but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the _____⁷ we shall be discharged from all liabilities under this guarantee thereafter.

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

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed _____⁵
- b) This Guarantee shall be valid up to _____⁶
- c) Unless the Bank is served a written claim or demand on or before _____⁷ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

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

For and on behalf of
(Name of the Bank)

Dated _____.

Place of Issue _____.

¹ NAME AND ADDRESS OF THE EMPLOYER. i.e Bharat Heavy Electricals Limited

² NAME AND ADDRESS OF THE CONTRACTOR / SUPPLIER/ FABRICATOR .

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ PROJECT/SUPPLY DETAILS AND CONTRACT VALUE

⁵ BG AMOUNT IN FIGURES AND WORDS

⁶ VALIDITY DATE

⁷ DATE OF EXPIRY OF CLAIM PERIOD

Note:

1. Units are advised that expiry of claim period may be kept 3-6 months after validity date. It may be ensured that the same is in line with the agreement/ contract entered with the Vendor.
2. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Contractor/Supplier /Bank issuing the guarantee.
3. In line with the GCC, SCC or contractual terms, Unit may carry out minor modifications in the Standard BG Formats. If required, such modifications may be carried out after taking up appropriately with the Unit/Region's Law Deptt.

4. In Case of Bank Guarantees submitted by Foreign Vendors-

- a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
- b. **From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)**
 - b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
 - b.2 **In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank** (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.
 - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). The BG Format provided to them should clearly specify the same.

Format of Letter for Extension/ Invocation of Bank Guarantees

Ref No

Dated

To

The Branch Manager

(Mention complete correct postal address of the BG issuing Bank Branch)

Dear Sir,

Sub: Bank Guarantee No dated issued by your bank valid upto for Rs
 in favor of M/s. BHEL. (Units name) on behalf of. (name of contractor/ vendor/ supplier etc.)

We refer to the above mentioned Bank Guarantee (BG) issued by your bank at the request of (Name of the contractor/ vendor/ supplier etc) towards.... (Nature of the BG issued) bank guarantee in favour of M/s. BHEL. (Unit's name) expiring on (validity date and the claim period). The said BG has to be kept valid till the full settlement/performance of the contractual terms and conditions entered into with (name of the contractor/ vendor/ supplier etc.). We have requested..... (name of the contractor/ vendor/ supplier etc.) to get the above said BG extended for a period of Months i.e. upto (dd/mrn/yy).

In case the validity period of the said BG is not extended within 15 days before the expiry date i.e. and received by us on or before ... or in case the bank is not in a position to extend the validity period of the BG for whatever reasons, then this communication shall be treated as **invocation** of the above said BG and also as our demand on you to pay us the amount of Rs (Rupees .. only) by means of Demand Draft/Banker's Cheque payable at (name of place)/ through RTGS (as per details attached) being the proceeds of the BG immediately on the date of expiry of the said BG, without any further intimation to you.

Please note that unless we revoke the claim under the above said BG in writing, your bank is liable to make the payment of the full amount of the BG forthwith to BHEL on

In the event this Bank Guarantee is extended for a period of at leastëë months and such letter of extension, duly executed on non-judicial Stamp Paper of requisite value, is received by us, this claim may be treated as withdrawn. It is requested that the extended Bank Guarantee should be send directly to BHEL.

This without prejudice to our rights under the guarantee and under the law.

Kindly acknowledge receipt of this letter.

Yours sincerely

FOR & ON BEHALF OF BHEL

(Authorised Signatory)

Copy forwarded to: (should be known to the bank).

The Officer concerned (name)

MIS

(Name of the contractor /vendor/ supplier etc. with Complete Postal Address).

Please arrange to extend the BG upto..... as advised by BHEL in our letter dated

(Separate letter also to be sent to the contractor /vendor/ supplier etc. well in advance) latest by..... under intimation to us, failing which this letter be treated as notice of invocation).

Notes:

- 1) To be typed on BHEL's Letter Head with full Postal Address of BHEL's Unit.
- 2) To be sent to the bank by Registered Post with Acknowledgement Due / scanned copy through email as well as through fax / Courier/ by hand (to be personally acknowledged) 60Days prior to the date of expiry of the BG in question and/or in accordance with the terms and conditions of the Guarantee deed.
- 3) Bank's acknowledgement of receipt of Extension/Claim letter should be positively obtained and the same should be preserved.

Format of Reminder letter to be sent to BG issuing bank atleast 15 days before expiry date of the BG in case the extended BG is not received in terms of contract from the issuing bank.

Ref No

Dated

To, .
The Branch Manager
(Mention complete correct postal address of the BG issuing Bank/branch)

Dear Sir,

Sub: Bank Guarantee No Dated issued by your bank valid upto for
Rs in favour of M/s. BHEL (unit's name) on behalf of (name
of contractor/ vendor/supplier etc.)

Please refer to our earlier letter No Dated requesting you to extend the above
Bank Guarantee (BG) for a period of Month(s) i.e. upto (date).

Till date we have neither received any advice from your bank nor received the extended BG in original as
requested by us in our letter dated (date).

In case the said BG is not extended as requested by us in our letter dated , this letter shall also be treated
as **demand for invocation** of the said BG. The amount of Rs (Rupees only) be paid to
BHEL positively on the date of expiry of the BG itself by way of Demand Draft/ Bankers cheque payable at
(name of place).

This without prejudice to our rights under the guarantee and under the law.

Kindly acknowledge receipt of this letter.

Yours sincerely

For & on behalf of BHEL
(Authorised Signatory)

Copy forwarded to:

The Officer concerned(name)

M/s

(Name of the contractor/ vendor/ supplier etc. with complete postal address) for information and necessary
action

Notes:

- (1) To be typed in BHEL Letter Head with full Postal Address of BHEL's Unit.
- (2) To be sent to the bank by Registered Post with Acknowledgement Due/ scanned copy through email as well as through fax / Courier/ by hand (to be personally acknowledged) atleast 15 days prior to the date of expiry of the BG in question and/ or in accordance with the terms and conditions of the guarantee deed.
- (3) Bank's acknowledgement of receipt of Extension/Claim letter should be positively obtained and the same should be preserved.

Format of third and final invocation letter to be sent to BG Issuing Bank five days before the of expiry of the BG, in case BG is not extended in terms of contract from by issuing bank.

Ref No

Dated

To,
The Branch Manager
(Mention complete correct postal address of the BG issuing Bank/branch)

Dear Sir,

Sub: Invocation of Bank Guarantee No Dated issued by your bank valid upto for Rs
in favour of M/s. BHEL. (unit's name) on behalf of (name of contractor/ Vendor/ supplier etc.)

Please refer to our earlier letter No Dated and letter dated wherein it was requested to extend the above said Bank Guarantee (BG) failing which to pay BHEL the amount of the BG by way of a Demand Draft/ Bankers Cheque.

Your bank has failed to renew the above BG till today as requested by BHEL. As already informed to you that the Contractor has failed to fulfill/ perform the said contract and in view of the same, we hereby demand and lodge our claim against the abovementioned Bank Guarantee for the payment of Rs (Rupees only). Please arrange to pay the amount by means of a Demand Draft/ Bankers' Cheque/ Through RTGS (as per details attached) today itself.

You are requested to immediately meet your obligation under the Bank Guarantee and make the payment.

Kindly acknowledge receipt of this letter.

Yours sincerely,
For & on behalf of BHEL
(Authorised Signatory)

Note:

- 1) To be typed in BHEL Letter Head with full Postal Address of BHEL unit.
- 2) To be sent to the bank by Registered Post with Acknowledgement Due/ scanned copy through email as well as through fax / Courier/ by hand (to be personally acknowledged) atleast 5 days prior to the date of expiry of the BG in question and/ or in accordance with the terms and conditions of the guarantee deed.
- 3) Bank's acknowledgement of receipt of claim letter should be obtained positively and the same should be kept on records.
- 4) This letter will also be taken by an authorized BHEL's official to the bank and acknowledgement is to be received positively. The matter is required to be followed up by the concerned official and efforts to be made for getting the payment immediately.

Format of Letter for Invocation of Bank Guarantees

Ref No
 Dated

To
 The Branch Manager
(Mention complete correct postal address of the BG issuing Bank Branch)

Dear Sir,

Sub: Bank Guarantee No dated issued by your bank valid upto for Rs in favor of M/s. BHEL. (Units name) on behalf of. (name of contractor/ vendor/ supplier etc.)

We refer to the above mentioned Bank Guarantee (BG) issued by your bank at the request of (Name of the contractor/ vendor/ supplier etc) towards.... (Nature of the BG issued) Bank Guarantee in favour of M/s. BHEL. (Unit's name) expiring on (date including the claim period).

We do hereby lodge our claim/ demand in terms of the Bank Guarantee and call upon you to immediately pay us Rsë ë ë ë ë ë (Rupeesë ë ë ë .only) by means of Demand Draft/Banker's Cheque payable at .. (name of place)/ Through RTGS (as per details attached)

Kindly acknowledge receipt of this letter.

Yours sincerely

FOR & ON BEHALF OF BHEL
 (Authorised Signatory)

Notes:

- 1) To be typed in BHEL Letter Head with full Postal Address of BHEL's Unit.
- 2) To be sent to the bank by Registered Post with Acknowledgement Due/ scanned copy through email as well as through fax / Courier/ by hand (to be personally acknowledged) sufficiently in advance before the date of expiry of the BG in question and/ or in accordance with the terms and conditions of the Guarantee Deed.
- 3) Bank's acknowledgement of receipt Claim letter should be positively obtained and the same should be preserved.
- 4) This letter will also be taken by an authorized BHEL's official to the bank and acknowledgement is to be received positively. The matter is required to be followed up by the concerned official and efforts to be made for getting the payment immediately.

List of Consortium Banks (As on 22.02.2017)			
	Nationalised Banks		Nationalised Banks
1	Allahabad bank	19	Vijaya Bank
2	Andhra bank		Public Sector Banks
3	Bank of Baroda	20	IDBI
4	Canara Bank		Foreign banks
5	Corporation bank	21	CITI Bank N.A
6	Central bank	22	Deutsche Bank AG
7	Indian Bank	23	The Hongkong and Shanghai Banking Corporation Limited
8	Indian Oversea Bank	24	Standard Chartered Bank
9	Oriental bank of Commerce	25	J P Morgan
10	Punjab National Bank		
11	Punjab & Sindh Bank		Private banks
12	State Bank of India	26	Axis Bank
13	State Bank of Hyderabad	27	The Federal Bank Limited
14	Syndicate Bank	28	HDFC
15	State Bank of Travancore	29	Kotak Mahindra Bank
16	UCO Bank	30	ICICI
17	Union Bank of India	31	Indusind Bank
18	United Bank of India	32	Yes Bank

ANNEXURE 2

BANK GUARANTEE REGISTER

SL.N O	DATE OF RECEIPT	NAME OF THE BANK ALONG WITH BRANCH	ISSUE DATE	VENDOR/ CONTRACTOR	PURCHASE ORDER/CONTRACT AGREEMENT/WOR K ORDER NO	AMOUNT OF BANK GUARANTEE TO BE FURNISHED AS PER TERMS AND CONDITIONS	AMOUNT OF BANK GUARANTEE FURNISHED	ORIGINAL VALIDITY	EXTENDED PERIOD OF VALIDITY	ORIGINAL CLAIM DATE	EXTENDED PERIOD OF CLAIM DATE	DATE OF RETUR N	PARTICUL ARS OF LETTER NO. WITH WHICH RETURNE D
1	2	3	5	6	7	8	9	10	11	12	13	14	15

TERMS AND CONDITIONS FOR INDIGENOUS OFFERS

- a) **Quotations :** Each Tender should be sent in duplicate in a sealed cover. Inner cover should be sealed with tenderer's distinctive seal and superscribed with correct Tender No., item of supply and due date of opening. Tender should not be addressed to any individual's names but only by designation and shall be addressed to
Manager/Purchase, BHARAT HEAVY ELECTRICALS LIMITED, BOLIER AUXILIARIES PLANT, INDIRA GANDHI INDUSTRIAL COMPLEX, RANIPET, VELLORE DISTRICT - 632406, INDIA.
- b) Tenders should be neatly typewritten and should be free from CORRECTION AND ERASURES. Corrections, if any, must be attested. All amount shall be indicated both in words as well as in figures. Where there is difference between amount quoted in words and figures, amount quoted in words shall prevail.
- c) Price should be net F.O.R. destination inclusive of risk in transit and remain valid for 90 days from the due date.
- d) If any Sales Tax is payable as extra to the quoted price it should be specifically stated in quotation failing which the purchaser will not be liable for payment of Sales Tax. Our TIN No. 33024364741 & CST Number 1141686.
- e) Products with I.S.I certification marks will be preferred.
- f) The applicable rate of excise duty shall be clearly indicated in the quote itself.
- g) The tenderer shall fill up the specification Deviation Disposition Report either NIL or the deviation taken by the tenderer against the Tender specification.
2. **Samples :** Wherever possible samples should be submitted separately whether specifically requested or not, so as to reach the purchase on or before the due date of the enquiry. They should be clearly marked with the Enquiry No. and the date on the outside cover to facilitate identification.
3. **Packing and Marking :** The supplier shall arrange for securely protecting and packing the stores to avoid loss or damages during transit.
4. **Terms of Payment :** Payment will be made within 45 days for MSME (Small / Micro) Vendors and 90 days for others after receipt and acceptance of materials at BHEL Stores or receipt of site acknowledgment in case of direct to site items of satisfactory receipt of materials at site. Where required by the purchase, the successful tenderer must send the operation and maintenance manuals, test certificates, drawings, etc., as called for, for the materials ordered. These should be sent immediately after despatch of the materials and a statement to that effect should be made in the invoice. Failure to comply with this provision will result in delay in payment of the bills. Goods despatched either by V.P.P. or by the documents presented through bank will not be accepted unless agreed to by the Purchaser.
The transporter's copy of Excise Invoice should accompany the material. The Original Invoice alongwith other documents shall be (a) routed through bank or (b) directly sent to us as called for in the contract. One set of the Advance copies of the above documents shall be sent to Manager / Finance (Stores Bill section), BHEL, BAP, RANIPET - 6 and one set to Manager / Purchase BHEL, BAP, RANIPET - 6.
5. **Liquidated Damages :** It is clearly understood among the parties to the contract that "Time is the essence of the contract". Therefore, the delivery of the goods specified in the purchase order should be made within the time limit prescribed. Where the seller supplies or despatches the goods, beyond the delivery period specified, the Purchaser will have no obligation to accept the goods, if accepted, liquidated damages at the rate of 1/2% of the value of goods delayed for each week of delay or part thereof will be levied without prejudice to any other relief or compensation due to the purchaser under any other condition of this contract.
6. **Risk Purchase :** Alternatively, the purchaser at his option will be entitled to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or despatch within the time stipulated as aforesaid or if the same were not available, the best and the nearest available substitute therefor. The supplier shall be liable for any loss which the purchaser may sustain by reason of such risk purchases in addition to penalty at the rate mentioned in Clause 5 above.
7. **Preferential Delivery :** It should be noted that if a contract is placed on higher tenderer as a result of this invitation to tender in preference to the lowest acceptable offer in consideration to the earlier delivery, the seller will be liable to pay to the purchaser the difference between the contract rate and that of the lowest acceptable tender on the basis of final price F.O.R. destination including all elements of freights, sales tax, duties and other incidentals in case of failure to complete supplies in terms of such contract within the date of delivery specified in the tender and incorporated in the contract.
8. **MODVAT CREDIT :** If any Excise duty is payable, the chapter head/sub - head reference and the rate of duty should be quoted. If the tenderer is availing MODVAT credit for his input materials, the effect of proforma credit should be passed on the purchaser. Tender under "MODVAT" shall be preferred.
9. **General :** a) The Purchaser reserves the right to split up the tender and place for individual items with different tenderers and also increase the quantity.

TERMS AND CONDITIONS FOR FOREIGN OFFERS

Offer : Offer in ENGLISH LANGUAGE AND IN TRIPPLICATE IN A SEALED COVER superscribing the enquiry number and due date shall be submitted addressed to: THE MANAGER / PURCHASE, BHARAT HEAVY ELECTRICALS LIMITED, BOILER AUXILIARIES PLANT, INDIRA GANDHI INDUSTRIAL COMPLEX, RANIPET - 632 406, TAMIL NADU, INDIA.

Offers should be firm for net FOB / FCA nearest Sea / air port price and C & F Chennai Port Price indicating the shipping specifications and the earliest delivery in the respect of others from overseas suppliers.

Documents :

- (i) Offers should be accompanied by detailed technical literature, catalogue and detailed dimensional drawing in ENGLISH and in DUPLICATE, or otherwise the offers will not be considered.
- (ii) In case overseas suppliers route their accredited selling agents, a letter of authority should be furnished mentioning the name and address of their selling agents, who are authorised to bid, negotiate and conclude a contract on their behalf.

Agency Commission : In respect of offers from overseas suppliers, agency commission, if any, payable to their agents in India shall invariably be shown separately in the proforma invoice and this will be paid by us in India, in Indian Rupees, on satisfactory completion of the contract.

Spare : The tenderer should quote separately for spares that are required for two years trouble free operation. The spares offer should accompany the offer of main equipment, otherwise the quotation will be overlooked.

Validity : The offers for main equipment and spares shall be kept open for acceptance for 90 days (Ninety days) for the date of opening of the tender.

Test Certificates, Operating and Maintenance Manuals : The tenderer shall clearly mention in their offer that Test Certificates and Operating and Manuals, etc., as called for in technical specification, in the required number of copies will be provided at no extra cost. If any amount is payable as extra, the same shall be indicated separately in the offer.

Terms and payment : In the event of an order the purchaser will arrange for an unconfirmed irrevocable letter of credit against presentation of documents. Under, no circumstances confirmed irrevocable letter of credit will be established by the purchaser.

General :

- (i) Preference will be given to suitable indigenous or ex-stock imported offers, failing which imported offers from incoming consignment against the indigenous supplies "Stock and sale Licence" will be accepted, if Stock and sale licence is not available with the indigenous suppliers, the same shall be indicated in their offer.
- (ii) The offer should reach us on or before 14.00 Hours of date of tender opening. The offer will be opened at 14.30 hours on the due date in the presence of the tenderers who may like to be present.
- (iii) **BANK GUARANTEE (if applicable) :** The supplier in the event of an order, should furnish a Bank Guarantee from an approved Bank at no extra cost in a proforma which will be supplied to the supplier, along with the order, for an amount equivalent to 10% of the value of the contract. The Bank Guarantee should remain in full force and effect during the period that would be taken of successful completion of the contract and shall continue to be enforceable till 12 months from the date of receipt of consignment at purchaser's site or 18 months from the date of last shipment at the port of Delivery, whichever is earlier.
- (iv) **INCOTERMS :** The definition for terms shall be as per Incoterms 2010
- (v) **PLEASE QUOTE YOUR RATE FOR ALL THE FOLLOWING CONDITIONS.**
 - (a) FOB on at sight L.C.
 - (b) On C & F Chennai Port India with at sight L.C.
 - (c) Rate on credit basis with rate of interest and period of credit.
 - (d) Rates with suppliers credit.

List of Consortium Banks

Sl. No	Nationalised Banks	Sl. No	Public Sector Banks
1	State Bank of India	18	IDBI
2	Allahabad bank		
3	Andhra bank	Sl. No	Private banks
4	Bank of Baroda	19	Axis Bank
5	Canara Bank	20	HDFC
6	Corporation bank	21	ICICI
7	Central bank	22	The Federal Bank Limited
8	Indian Bank	23	Kotak Mahindra Bank
9	Indian Oversea Bank	24	Indusind Bank
10	Oriental bank of Commerce	25	Yes Bank
11	Punjab National Bank		
12	Punjab & Sindh Bank	Sl. No	Foreign banks
13	Syndicate Bank	26	CITI Bank N.A
14	UCO Bank	27	Deutsche Bank AG
15	Union Bank of India	28	HSBC
16	United Bank of India	29	Standard Chartered Bank
17	Vijaya Bank	30	J P Morgan

Online SRF Submission Procedure

Following are the formalities to be completed by your company for registration purpose.

NOTE: BEFORE PROCEEDING FOR ONLINE REGISTRATION " PLS READ STEPS FOR FILLING UP ONLINE REGISTRATION FORM - HELP MENU" - DETAILS ATTACHED WITH THIS MAIL

With effect from 01.04.2015 onwards, we have migrated to online Supplier Registration Form (SRF) as per our Corporate guidelines. **Supplier Registration Form (SRF)** is to be fed in our BHEL website portal – **ie., PDF documents of SRF and its annexure as called for shall be signed by authorized signatory & uploaded in portal.**

We request to visit our Web Site : www.bhel.com and click under heading "Supplier Registration" and fill up the **"Supplier Registration Form"** which is available in the Online Supplier Registration Portal.

Or else, copy the following URL Link and paste in the web link address: http://www.bhel.com/vender_registration/vender.php and proceed with.

Or else, type directly as <http://203.129.195.108>

Click the button "search material" on the home page of supplier registration portal and search thoroughly your required material / product

*After completing the material search then proceed for User Id & Password for filling up the details of registration requirements. **Note: If you are an already registered supplier with any of our BHEL Unit - pls select "existing permanent supplier" or else select "New Registration" and then proceed accordingly.***

Please note that for a foreign suppliers' there is a separate format to be filled in, which may be taken care suitably.

After successful submission of SRF along with all annexures as called for thro' online i.e., authorized signatory signed pdf documents of SRF and its annexures are to be uploaded thro' online portal and confirm the same in **"form dispatch"** area ie., registration part-4 – wherein supplier has to confirm that all the documents were submitted "online" and click the button **"confirm"**. After clicking confirmation button, the same will be appearing against BHEL Ranipet for registration.

Looking for a long successful & sustaining business association with BHEL.

Payment Mechanism at BHEL, Ranipet

(Effective for all tenders issued by BHEL Ranipet from 01 July 2011 onwards unless otherwise notified of change/s in writing given by an authorized official of BHEL, Ranipet)

BHEL, Ranipet's payment mechanism will be as follows: (All Bidders are requested to read this carefully and take note of it before submitting their offer)

All bills of Suppliers processed for payment by BHEL, Ranipet shall pass through the following mile stones:

- (1) Receipt of materials at BHEL, Ranipet Stores (evidenced by the Day-Book Number and Date generated at BHEL Stores, Ranipet) or Receipt of materials at Project Site / Destination specified in the Purchase Order (as evidenced by the acknowledgement given by the Consignee).
- (2) Acceptance of the supplied materials at BHEL Stores, Ranipet. (Proof of evidence: Stores Receipt voucher - Short form "SRV", raised by BHEL Stores, Ranipet referenced by the SRV Number and Date)
- (3) Receipt and Registration of the Bills / Invoices of the Supplier at BHEL, Ranipet Accounts Department. (evidenced by the ABS Number and Date)
- (4) Receipt of clarifications, if any that may be required by BHEL, Ranipet Accounts or Purchase Department, from the Supplier. (As evidenced by the IOM Inward Date)
- (5) Bill processing and passing.
- (6) Payment release.

All these events are transparently available in the SCM web-site of BHEL, Ranipet, { <http://bapscm.bhelrpt.co.in/purc> } which can be viewed by all registered suppliers with a password.

Allowed Time frames:

- A] From DB to SRV: 10 Days
- B] From SRV to ABS: 15 Days
- C] From ABS to Bill Pass: 07 Days (if Stage 4 above is not applicable)

OR

From IOM to Bill Pass: 07 Days (if Stage 4 above is applicable)

- D] From Bill Pass to Payment Release: As per payment terms of the Purchase order.

All Suppliers payment/s would be released based on seniority of receipt of the processed bills at the payment section of BHEL, Ranipet Accounts Department.

The seniority would be based on the sequence of milestone events listed above.

In the sequence of the bill processing the preceding mile-stone seniority will be void, if the subsequent event occurs beyond the permitted time frame between two successive events.

Thus for example:

Start seniority would be with the DB date.

If the SRV date is greater than 10 days of the DB date, then the seniority of the DB date would be replaced by the SRV date.

If the ABS date is greater than 15 days of the SRV date, then the seniority would be reckoned by the ABS date.

If the Bill pass date is greater than 07 days of the ABS date then the seniority would be the date of inward receipt of the IOM.

The logics of these sequence is that SRV, ABS, IOM inward entry are dependent entirely on submission of correct documentation by Suppliers, as called for in the Purchase Order. If the documents are correctly submitted each of the milestone listed above will occur within BHEL, Ranipet within the timelines specified above.

Hence, in their own interest all Suppliers are requested to take note of this process and comply with the same.

Caution: Suppliers' payments would get delayed / affected if they fail to adhere to the submission of the documents specified in the Purchase Order / Contract, since the listed milestone events occurrence are contingent upon the availability of the requisite documents.

SLNO	PARAMETERS/TECHNICAL INFORMATION OF SLURRY AND PUMP DATA SHEET	Gypsum bleed pump	Emergency Transfer Pump	Filtrate Water Tank Pump	Secondary hydrocyclone feed tank pump	Waste Water Tank Pump	Limestone Slurry Feed Pump	Auxiliary Absorbent Tank Pump	Primary hydrocyclone feed tank pump	Absorber area drain sump pump	Gypsum area drain sump pump	Limestone area drain sump pump	Bidder conformat ion
1	pump slno	1	2	3	4	5	6	7	8	9	10	11	-
2	pump location	out door	out door	out door	out door	out door	out door	out door	out door	out door	out door	out door	
3	Mounting orientation (H/V)(Horizontal/Vertical)	H	H	H	H	H	H	H	H	V	V	V	
4	Specific gravity of slurry	1.2	1.2	1.1	1.112	1.023	1.2	1.2	1.2	1.2	1.2	1.2	
5	Viscosity at pump	0.01 Pa.S	0.01 Pa.S	0.004Pa.S	0.004Pa.S	0.003Pa.S	0.03 Pa.S	0.01 Pa.S	0.01 Pa.S	0.01 Pa.s	0.01 Pa.s	0.03 Pa.s	
6	Slurry concentration	30 wt%	30 wt%	12.5wt%	16.6 wt%	3.0 wt%	30 wt%	30 wt%	30 wt%	30 wt%	30 wt%	30 wt%	
7	Maximum solid particle size	200 mesh (75 micron)	200 mesh (75 micron)	200 mesh (75 micron)	200 mesh (75 micron)	200 mesh (75 micron)	200 mesh (75 micron)	200 mesh (70micron)	200 mesh (70 micron)	6-7mm	6-7mm	6-7mm	
8	Normal solid particle size,d50	325 mesh(43 micron)	325 mesh(43 micron)	325 mesh(43 micron)	325 mesh(43 micron)	325 mesh(43 micron)	325 mesh(43 micron)	325 mesh(43 micron)	325 mesh(43 micron)	325 mesh(43 micron)	325 mesh(43 micron)	325 mesh(43 micron)	
9	Hardness of particle	5-7 (Mho scale)	5-7 (Mho scale)	5-7 (Mho scale)	5-7 (Mho scale)	5-7 (Mho scale)	5-7 (Mho scale)	5-7 (Mho scale)	5-7 (Mho scale)	5-7 (Mho scale)	5-7 (Mho scale)	5-7 (Mho scale)	
10	Chloride concentration	30,000 ppm (max)	30,000 ppm (max)	30,000 ppm(max)	30,000 ppm (max)	30,000 ppm (max)	100ppm (max)	30,000 ppm (max)	30,000 ppm (max)	30,000 ppm	30,000 ppm	100 ppm max	
11	Slurry to be handled	Gypsum slurry	Gypsum slurry	Gypsum slurry	Gypsum slurry	Gypsum slurry	Limestone Slurry	Gypsum slurry	Gypsum slurry	Gypsum Slurry	Gypsum Slurry	Limestone Slurry	
12	SiO2 concentration	4-6g/l	4-6g/l	4-6g/l	4-6g/l	4-6g/l	4-6g/l	4-6g/l	4-6g/l	4-6g/l	4-6 g/l	4-6 g/l	
13	PH	4-8	4-8	4-8	4-8	4-8	5-8	4-8	4-8	4-8	4-8	4-8	
14	Minimum & maximum liquid level in the tank (in m)	1.5 to 6	1.5 to 6	1.3 to 6.2	1.3 to 6.2	1.4 to 7.6	1.2 to 14.8	1.2 to 12.5	1.4 to 8.0	1.4 to 3.5(pump mounting height from tank base 4.3)	1.4 to 3.5(pump mounting height from tank base 4.3)	1.4 to 3.5(pump mounting height from tank base 4.3)	
15	Normal liquid level in the tank	5.0	5.0	6.0	6.0	7.4	14.6	12.3	7.8	3.3	3.3	3.3	
16	Operating temperature range	Normal:63 Deg C Design:70 Deg C	Normal:63 Deg C Design:70 Deg C	Normal:59.5 Deg C Design:70 Deg C	Normal:63 Deg C Design:70 Deg C	Normal:63 Deg C Design:70 Deg C	Normal:45 Deg C Design:50 Deg C	Normal:63 Deg C Design:70 Deg C	Normal:63 Deg C Design:70 Deg C	Normal:63 Deg C Design:70 Deg C	Normal:63 Deg C Design:70 Deg C	Normal:45 Deg C Design:50 Deg C	
17	Head of the pump (in meter of slurry column)	40	25	35	45	70	55	25	55	30	25	25	
18	Capacity of the Pump(in m3/hr)	180	660	520	312	140	90	110	540	210	50	50	
19	Number of pump	6 nos.	3 nos.	2 nos.	2 nos.	2 nos.	6 nos.	2 nos.	2 nos.	6 nos.	2 nos.	2 nos.	
20	Working and standby	(1W +1 S) x 3	(1W) x 3	(1W + 1S)	(1W + 1S)	(1W + 1S)	(1W +1 S) x 3	(1W + 1S)	(1W + 1S)	(1W +1 S) x 3	(1W+1S)	(1W+1S)	
21	Discharge orientation	Vertical up	Vertical up	Vertical up	Vertical up	Vertical up	Vertical up	Vertical up	Vertical up	Vertical up	Vertical up	Vertical up	
22	Duty condition (continous /intermittent	Cont	Inter	Cont	Cont	Cont	Cont	inter	Cont	inter	inter	inter	
23	Power loading for bid evaluation	Applicable	NA	Applicable	Applicable	Applicable	Applicable	NA	Applicable	NA	NA	NA	
24	Flange standard	B16.5 class 150	B16.5 class 150	B16.5 class 150	B16.5 class 150	B16.5 class 150	B16.5 class 150	B16.5 class 150	B16.5 class 150	B16.5 class 150	B16.5 class 150	B16.5 class 150	
25	Mechanical seal required (Duplex & SiC/SiC)- vendor also to confirm flushless wherever called	with flushing	with flushing	Flushless	Flushless	Flushless	Flushless	Flushless	Flushless	NA	NA	NA	
26	Connecting piping	-	-	-	-	-	-	-	-	CD4mCu for elbow and SS316L for pipe	CD4mCu for elbow and SS316L for pipe	CD4mCu for elbow and SS316L for pipe	