

Enqslno	Materialcode	Description	Lot no	Qty	Unit	Dely dt	Destination	Bidder Response
1	RFW010420001	COMPLETE AGITATOR (SIDE ENTRY) ASSEMBLY FOR ABSORBER TANK. AS PER SPEC FGD:AGITATORS:R00,BHUSAWAL:FGD: AGITATORS:R00 & AGITATORS:QR-3K:BHUSAWAL	1	3	ST	24-Mar-21	Site Office/Bhusawal project	
2	RFW010430001	SUPERVISION CHARGES FOR ERECTION & COMMIS SIONING OF ABSORBER AGITATORS (1 VISIT OF 10 DAYS). AS PER SPEC FGD:AGITATORS:R00,BHUSAWAL: FGD:AGITATORS:R00& AGITATORS:QR-3K: BHUSAWAL	1	1	ST	24-Mar-21	Site Office/Bhusawal project	

Enq sno	Material code	Item Description	Qty	Unit	Unit rate	Total rate	Price Impact	Price Impact	Price Impact
1	RFW010420001	COMPLETE AGITATOR (SIDE ENTRY) ASSEMBLY FOR ABSORBER TANK. AS PER SPEC FGD:AGITATORS:R00,BHUSAWAL:FGD: AGITATORS:R00 & AGITATORS:QR-3K:BHUSAWAL	3	ST					
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TECHNICAL SPECIFICATION OF AGITATORS

FGD:AGITATORS:R00



BHARAT HEAVY ELECTRICALS LIMITED
(A GOVT OF INDIA UNDERTAKING)

Flue Gas Desulphurization Group-FGD,
Ranipet

TECHNICAL SPECIFICATION OF AGITATORS

SPECIFICATION NO : FGD:AGITATORS
BUYER (EPC) : BHEL
APPLICATION : WET LIMESTONE FGD

00	24-09-2020	Fresh Release	<i>Jyotish Kumar Patel</i> Jyotish Kumar Patel	<i>S. Shanmuga Sundaram</i> Shanmuga Sundaram S	<i>V. Kesavan</i> V. Kesavan
REV	Date	Description	Prepared	Checked	Approved

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I) DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER:

Sl. No.	Description	Offer part	Purpose
1.	Documents for meeting the Pre-Qualification Requirement (3K format has to be submitted along with supporting documents)	Part -1	Qualification requirement for considering the offer
2.	Reference list – Annexure-I	Part -1	Qualification requirement for considering the offer
3.	Compliance to the technical specification (Complete Specification with Signature and Seal along with filled Annexures)	Part-1	Technical evaluation
4.	Data sheet of all Agitators (As per Annexure-II)	Part -1	Technical evaluation
5.	GA drawing, Exploded view with Material of construction, total weight of all Agitators models offered	Part -1	Technical evaluation
6.	Performance curve & TS curve of Agitators	Part -1	Technical evaluation
7.	GA drawing of Electrical motor & Data sheet and performance curves of all motors (As per Annexure-IV)	Part -1	Technical evaluation
8.	Schedule of Guarantees (Annexure-V) specific to the Enquiry	Part -1	Technical evaluation
9.	List of Deviations (Annexure-VI)	Part -1	Technical evaluation
10.	Mandatory Spare list	Part -1	Technical evaluation
11.	Agitator Motor Sizing Calculation (Annexure-III)	Part -1	Technical evaluation
12.	Motor vendor list and mechanical seal vendor list	Part -1	Technical evaluation
13.	Quality Plan	Part -1	Technical evaluation
14.	Start-up & Commissioning Spares	Part -1	Technical evaluation
15.	List of Special Tools	Part -1	Technical evaluation
16.	Catalogue	Part -1	Technical evaluation
17.	Priced offer	Part -2	Commercial evaluation



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II DOCUMENTS TO BE SUBMITTED AFTER CONTRACT:

Sl. No.	Description	Purpose	Delivery Time
1.	GA drawing, Exploded view, sectional view with Material of construction, mechanical seal , gearbox for all Agitator models	END CUSTOMER/BHEL approval to start manufacturing	2 week
2.	Data sheet for all Agitator	END CUSTOMER/BHEL approval to start	2 week
3.	Agitator Performance curve of all Agitators	END CUSTOMER/BHEL approval to start	2 week
4.	Electrical motor GA drawing & Data sheet and performance curves of all motors	END CUSTOMER/BHEL approval to start manufacturing	2 week
5.	Quality plan & Inspection and Test Procedure	END CUSTOMER/BHEL approval for inspection	2month after contract
6.	Agitator and Motor Sizing Calculation (Annexure-III)	END CUSTOMER/BHEL approval to start	2 week
7.	Bending moment calculation	END CUSTOMER/BHEL approval to start manufacturing	2 week
8.	Utility Consumption	To arrange utility	2 week
9.	Foundation Data including Anchor plan	To civil design	2 week
10.	Lubricating oil list	Record purpose	4 week
11.	Special tools list	For maintenance	4 week
12.	Installation and assembly procedure	For erection	4 week
13.	Approximate weight of each skid	To arrange lifting device	4 week
14.	Pre Commissioning Check List	For erection	4 week
15.	Operation and Maintenance Manual	For O&M	4 week
16.	Start-up & Commissioning Spares	For commissioning	4 week
17.	List of Special Tools	For arranging	4 week
18.	P & I Diagram (if applicable)	For information	4 week



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1.0 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 Agitator shall follow the latest applicable Indian/International (AISI / ASME/EN/Japanese) Standards.

2.0 INTENT OF SPECIFICATION

This specification covers the minimum requirements for the complete design, material, manufacturing, shop inspection, testing at the manufacturer's works, supervision of erection & performance testing at bidder's works/ site of Agitators along with accessories which is furnished in the Flue Gas Desulphurization plant for END CUSTOMER Project. The following points have to be noted.

- a. Agitators are envisaged in various tanks, details of which are given in Technical Information of Agitators.
- 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 /Pre-qualification requirement of END CUSTOMER. 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, their offer will be rejected.
- 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 VI- LIST OF DEVIATIONS OR EXCEPTIONS TO THE ENQUIRY DOCUMENT**)
- 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 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.



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3.0 PROVENNESS CRITERIA/Pre-QUALIFICATION REQUIREMENT:

The Bidders are required to meet the Qualification Requirement (PQR) for Agitators as per **Provenness Criteria & shall submit the credentials as called in Attachment 3K. Only OEMs qualifying as per the Qualification requirement shall be considered for placement order.**

4.0 POWER SUPPLY DETAILS:

1.	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.	

5.0 SCOPE OF SUPPLY

Scope for the bidders shall include Design, Manufacturing, 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 END CUSTOMER.

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.

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



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A) For Horizontal (Side Entry) Agitators:

Sl. No	Scope
1.	AGITATOR complete with
	i. AGITATOR Blades
	ii. AGITATOR Shafts
	iii. Coupling arrangement (Flexible)
	iv. Single Mechanical Seals
	v. Shaft Sleeve
	vi. Lanterns/ Stools (Bearing Housing), Safety Guard
	vii. Bearings
	viii. Agitator Mounting Flanges with gaskets and fasteners
	ix. Drive Motor(IE3) with gearbox / belt and pulley arrangement
	x. Supporting arrangement of Side Entry Agitator on the tank Wall. Vessel Nozzle and mating flange for supporting on the tank wall , gaskets and fasteners
	xi. Flushing system for start up consisting of : Pipe with Flange , Nozzle and mating flange, Blind flange for plugging.
	xii. Foundation plate with foundation bolts, vessel nozzle
	xiii. Painting and Rust Prevention during shipment and construction
	xiv. Supervision of Erection & commissioning at site
	xv. Special tools & tackles as applicable
	xvi. Start-up spares as applicable
	xvii. Installation, operation and maintenance manuals
	xviii. Any other items required for completeness of the equipment except the items covered in the exclusions.

B) For Vertical (Top Entry) Agitators :

Sl. No	Scope
2.	AGITATOR complete with
	i. AGITATOR Blades
	ii. AGITATOR Shafts
	iii. Coupling arrangement (Flexible)
	iv. Gland Packing, Seals, O Rings, Glands
	v. Shaft Sleeve
	vi. Lanterns/ Stools (Bearing Housing), Safety Guard
	vii. Bearings
	viii. AGITATOR Mounting Flanges with gaskets and fasteners
	ix. Drive Motor(IE3) with gearbox/ belt and pulley arrangement
	x. Mating Flange for Supporting on Slurry Tank Roof
	xi. Painting and Rust Prevention during shipment and construction
	xii. Supervision of Erection & commissioning at site
	xiii. Special tools & tackles as applicable
	xiv. Start-up spares as applicable
	xv. Installation, operation and maintenance manuals
	xvi. Any other items required for completeness of the equipment except the items covered in the exclusions.



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5.1	TECHNICAL REQUIREMENTS
1.	Agitators shall be supplied in tanks and vessels to prevent caking and settlement of particles out of the slurry, e.g. in the absorber vessel, limestone mill recycle tanks, limestone slurry tank, Auxiliary Absorbent tank, and sumps etc.
2.	All agitators shall be designed for continuous operation unless otherwise specified. The design of the agitators shall be of proven type. CFD analysis, if required, shall be provided during detailed engineering or drawing approval stage at no extra cost.
3.	Standard type agitators with suitable characteristics shall be used wherever practical. The agitators shall be complete with motor, gearbox, agitator shaft, coupling, safety guards, mechanical seal (for side entry agitators), impeller, support legs, agitator mounting flange including bolts nuts and gasket etc.
4.	All agitator parts and accessories in contact with the stirred fluid shall be constructed of materials specifically designed for the conditions and nature of the stirred fluid and be resistant to erosion and corrosion.
5.	MOC of various agitator parts shall be as per "Technical Information of Agitators for respective project". This does not release the bidder of the responsibility for selecting the correct materials. All parts which are in contact with slurry or in contact with slurry fumes shall be considered as wetted part. The material selected shall be suitable to the service conditions.
6.	Each agitator and its associated equipment shall be arranged in such a manner as to permit easy access for operation, maintenance and agitator removal without interrupting plant operation. It shall be possible to remove the sealing devices of the Agitators of the absorber vessel without having to drain completely the absorber.
7.	To prevent mechanical blocking load start-up after standstill of pumps, piping and agitators for slurries shall be applied with C-hose connection.
8.	Lifting lugs and eyes and other special tackle shall be provided as necessary to permit easy handling of the agitators and their components.
9.	Static and dynamic (as far as applicable) balancing of all agitators shall be carried out after assembly.
10.	All agitator parts and components shall be designed and calculated for fatigue life, considering maximum bending loads, induced by fluctuating hydraulic forces and torsional loads, based on the installed motor power. For side entry agitators the alternating bending moment resulting from impeller and shaft weight has to be considered additionally.
11.	All exposed moving parts shall be covered by guards.
12.	The shape of the impeller blades of side entry agitators shall be designed to avoid wear on the impellers which will affect the agitator performance as specified for a minimum period of 2 years of continuous operation under design conditions for the range of coal & limestone specified in the specification. In order to avoid excessive wear impeller tip speeds must not exceed 12 m/s
13.	Belt drives (if applied) shall be properly designed to provide a minimum lifetime of 2 years under design conditions
14.	It shall be noted that all Agitators are meant for keeping the solid particles in suspended mode in liquid with "Full off-Bottom Suspension" of solid particles to 98% of liquid column to virtually "Uniform Solid Concentration". No chemical reaction will takes place.



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15.	Maintaining a uniform concentration over the 95% of liquid column. Absolute sweeping of solid particle from tank bottom is a must for all Agitators. If speed is required to be increased to guarantee the above requirements; the same can be increased by vendor. Bidder's machines that consume less power will be in an advantageous position.
16.	It is to be noted that in continuous process any deposit at tank bottom is the loss of material which are not getting converted as per process. Hence, total loss of material by sedimentation is a loss to FGD Process & determines the "In efficiency of the Agitator".
17.	Vendor should ensure nil settlement; utilization of solid material shall be a guaranteed parameter and will be assessed in percentage (%) term to net wet of solid mass of inflow or out flow. This is one of the guarantee parameter.
18.	Agitator and its driver shall perform on the test stand at shop and on the Agitator's permanent location at site within vibration limit the vibration of combined unit will be the responsibility of Agitator manufacturer. Agitator manufacturer is to ensure that Site performance of vibration is one of the "Acceptance Criteria" of the equipment. Please note vibration at test stand can only be taken as for information.
19.	Every Tank will have a pump whose suction line shall be connected to tank. These pumps are to operate continuously at the lowest operating level which is decided by Process requirement. Hence, the minimum operating level of liquid in every tank for every Agitator is a must to assess the combined operation of Agitator as well as that of pump alone. The Tank water level is indicated as per "Technical Information of Agitators".
20.	Agitator must have low-pitch propeller with low solidity ratio and Power Number of 0.3-0.35. The Maximum Input Power at motor terminal shall be considered as a guaranteed parameter under "Schedule of Guaranteed Parameters" in "Annexure-V-Schedule of Guarantees"- and the same shall be calculated for maximum liquid level in tank. A calculation of power specifying the hydraulic power of Agitator, Seal loss, Gear box and Motor internal loss must be submitted along with the offer. A characteristics curve showing power versus liquid level should be submitted from the lowest liquid level, required for Agitator to maximum liquid level in the tank. Motor should be selected based on the highest power demand with a margin as per clause 5.3.1 at maximum liquid level, taking into account frequency variation.
21.	Bidder shall provide the design and arrangement of baffle plates in circular tanks. Baffle plates are in BHEL scope.
5.2	CONSTRUCTIONAL FEATURES
A)	BLADE AND HUB OF PROPELLER
I)	The Blade design of the Agitator to be of most efficient design in order to offer least power consumption. The Agitator power consumption is part of the guarantee parameters.
II	Although Agitator will have substantial low speed because of reduction Gear Box, hydraulic unbalance at impeller can cause severe vibration, hence it is mandatory that rotating assembly shall be dynamically balanced to its rated speed.
III	Impeller should be dynamically balanced to Gr: G16: ISO-1940 after rubber lining of shaft.
B)	SEAL
1.	<u>Horizontal / Side Entry Agitators:</u>
I.	Agitators should be provided with Single Stage mechanical seal. the mechanical seal should



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	be as per ISO-21049 / API 682
II.	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.
III.	Design the mechanical seals chamber to have sufficient room to lubricate and get seal face cool with its own slurry.
IV.	Provide requirements for periodical flushing to rinse the seal face for leaked slurry.
V.	All mechanical seals, regardless of type or arrangement, shall be of the cartridge design. Hook sleeve cartridge should not be used.
VI.	Requirement of flushing water, its quantity, and pressure to be indicated in data sheet.
VII.	Zero leakage is the intension of this specification. However, quantity of leakage, if it is unavoidable, it should have a provision of collecting / or discharging back to the tank.
VIII.	Mechanical seals shall be fitted and installed in the Agitator before shipment and shall be clean. Mechanical seals shall be plugged with screw for shipping.
IX.	Intention of the specification is not to specify Type of Seal, Seal design, Spring configuration, Seal configuration, Balanced or Unbalance type etc. Agitator manufacturer to decide the same along with seal manufacturer the best seal that is suitable for the offered Agitator
X.	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.
XI.	The sub-vendor of the seal shall be approved by END CUSTOMER during contract execution.
2.	<u>Vertical Agitators for Other Slurry Tanks & Drain Pit Tanks</u>
I	Agitator shall be supplied with stuffing box or any proven equivalent or superior sealing type. Mechanical and hydraulic conditions in the seal chamber, required to maintain a stable film at seal face, including temperature, pressure and flow, shall be jointly established by Agitator manufacturer and seal manufacturer, and shall be noted in data sheet submitted in tender. If mechanical seal is offered by bidder, the mechanical seal should be as per ISO-21049 / API 682.
C)	SHAFT
	Use of dissimilar material at flange joint shall be avoided to eliminate any crevice corrosion. Spacing of the shaft joint should not be more than 3.0 m for easy assembly if it is more than 40kg. If welding is used for joining two tubes, welding joint must be 100% radio graphed. If split shaft is proposed for larger tanks, shaft flange at the joining interface has to be rubber lined at manufacturer's works and necessary fasteners have to be provided.
D)	BEARING & BEARING HOUSING IN GEAR BOX
	Bearing shall be of rolling type radial and thrust bearing (FAG/SKF make only) as required. Thrust bearing shall be sized for continuous operation under all specified condition.
	Thrust bearing shall provide full load capability if the Agitator's normal direction of rotation is reversed. Up-thrust and Down-thrust load must be taken into account in sizing bearing. Life of the every anti-friction bearing, used in the bearing housing as per manufacturer's



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	design, should have L10 of 25000 hr (minimum).
	Bearing housing should be grease/oil lubricated. If bearing is oil lubricated, constant-level sight-feed oiler of 100cc size or bigger capacity is to be provided. Bearing housing should have oil drain, constant oil level indicator. A provision of one(1) number G1/2" thread (ISO-228, Part-1) port is required for remote control of temperature of bearing housing oil bath RTD.
	If bearing housing requires cooling water, volume and pressure of cooling water is to be indicated in Technical Data Sheet.
	Lubricating oil will be the responsibility of Gear Box 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.
E)	MATERIALS
	Agitator components designated as "Full Compliance Material" shall meet the requirements of the industry specification as listed for the material in the table as well as in the specification in the respective section.
	A detail quality plan is to be submitted along with offer for all items marked "Full Compliance Material".
	Final acceptance of the quality plan will be approved by ultimate user (hereafter called END CUSTOMER). Hence, it is expected that manufacturer to submit quality plan (QAP) along with the offer. The same shall be followed at post order stage also. QAP should be as per the best practice followed internationally to avoid any conflict of interest.
F)	Driver (Motor)
1	Driver shall be sized to meet all specified operating conditions including bearing housing, seal, external gear box and coupling loss(if any).
2	Motor shall be able to accelerate to speed at reduced voltage and frequency as specified in "Site Power Supply Condition" as per Clause: 4.1.
3	It should meet Motor specification enclosed.
G)	GEAR BOX
	Gear box should be vertical flange mounted solid shaft type (Vertical Agitators), reducing speed type, specially designed for the requirement of Slurry mixing and to be manufactured by the Agitator supplier. Complete up-thrust and down-thrust, developed by Agitator shall be taken by thrust bearing housing of Gear Box. Rating of at Gear box shall be at least 1.5 times the rated torque of Agitator.
H)	COUPLING & COUPLING GUARD
I.	Coupling and coupling guard should be supplied between driver and driven equipment.
II.	Coupling should be designed taking into consideration adequate service factor.
III.	Design rating of the coupling (excluding service factor) should be indicated in data sheet.



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IV.	Coupling must be having locking screw so that it does not slide over shaft in due course operation.
V.	Vertical Agitators - Coupling between Motor and Gear Box shall be Spacer-type flexible coupling, made of Cast Iron. Spacer length shall be of sufficient length so than Motor and Gear Box shall be able to run independently at no-load condition by detaching the respective coupling.
VI.	It is desirable that for servicing of seal, coupling half should not be removed. Coupling should be dynamically balanced to Gr: G6.3, ISO-1940.
VII.	Removable coupling guard shall conform to the requirements of all applicable national, industrial or statutory regulations.
I)	PLATE AND FASTENING BOLTS
I.	Base plate shall be interpreted as the component of Agitator assembly through which the whole load will be transmitted to the Sole Plate/Nozzle over which the equipment will be mounted. The Base plate shall be fabricated with mild steel of structural quality (UTS=42N/sq mm minimum) with anti-corrosive paint of sufficient dry-film thickness.
II.	Base plate must have provision of leveling on its intended mounting place. Sole plate is not in the scope of supply of Agitator manufacturer. It should be noted that Sole plate will be rubber lined to prevent any leakage of corrosive gases
III.	Alignment between Gear Head Shaft and Agitator shaft shall be within the permissible limit of Gear Box. Similarly, misalignment between Motor shaft and Gear Box Shaft shall be within 0.050 micron (radial) and 2 degree (angular) or better as per requirement of Motor and Gear Box
IV.	Sole plate with desired number of hole, will be machined on one side. Sole Plate shall be welded to the structure after leveling, as recommended by Agitator manufacturer and rubber lining is completed before placing the equipment in its desired location.
J)	OTHER COMPONENTS
	All fasteners used in wetted condition must be of Alloy 926 or better material so that even if it comes in contact with liquid by swelling of rubber, thread remains unaffected. Raw material of fastener must undergo Inter-granular Corrosion test as per ISO-3651, Part-1 for Nitric Acid test.
	GENERAL REQUIREMENT OF SIDE ENTRY AGITATORS:
I.	All Agitators shall be designed for continuous operation.
II.	The Material of Construction (MOC) of side entry Agitators shall be as per Cl 4.0
III.	It should be of Flange mounted type.
IV.	Nozzle size, on which Agitator shall be mounted, shall have enough opening to Insert rotating assembly from side. Vendor to provide the nozzle and flange along with the agitator.



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V.	The Bidder to consider Gypsum Sedimentation during stoppage of Agitator.
VI.	The following information to be provided along with the bid: a) <u>Impeller Diameter</u> b) <u>Impeller Speed</u> c) <u>Agitator Pumping Capacity (m³/min)</u> d) <u>Volume per Agitator:</u>
	<u>TOP ENTRY AGITATORS IN OTHER SLURRY TANKS & DRAIN PITS:</u>
I.	All Agitators shall be designed for continuous operation.
II.	The Material of Construction (MOC) of Top Entry Agitators shall be as per CI 4.0
III.	It should be roof mounted.
IV.	Agitators shall be vertical mounted type and shall be driven by motor with reducing speed gear box of rigid type, solid shaft coupling between gear box and agitator and flexible coupling of spacer type coupling between Motor and Gear Box. Both Gear Box and Motor should be vertically/horizontally flange mounted type with a common frame of the whole equipment. The entire thrust load of agitator should be transmitted to the thrust bearing of Gear box.
V.	Cable entry to the Motor terminal box should preferably be from top when motor is vertically mounted at its position and it should be easily accessible.
VI.	Nozzle size, on which Agitator shall be mounted, shall have enough opening to Insert rotating assembly from top.
VII.	Impeller should be dynamically balanced to Gr: G16: ISO-1940 after rubber lining of shaft.

5.3 MOTOR

➤ **Degree of Protection**

Degree of protection for various enclosures shall be as follows:

- a) Outdoor motors : IP 55
- b) Cable box-Outdoor area : IP 55

➤ **Codes and Standards**

- a) Three phase induction motors : IS325
- b) Single phase AC : IEC 60034

➤ **Painting**

Paint shade shall be as per RAL5012

Motors shall be of IE3 energy efficient class.



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5.3.1 AC Motors Type

AC Motors:

All AC motor shall be Squirrel cage induction motor and, shall be suitable for direct – on-line starting. Rating of the motor should of Type S1 (Continuously rated) as per ISO-60034, Part-1. Rating of motor must be selected with minimum margin(as per the below table) above the maximum load demand of the driven equipment under entire operating range including voltage and frequency variation:

Agitator Rated BkW	Motor Margin
<22KW	125% of Agitator Rated BkW
22KW-55KW	115% of Agitator Rated BkW
>55KW	110% of Agitator Rated BkW

- All motors, the maximum temperature rise shall be 70⁰ C by resistance method for both class B & F insulation.
- For motors with starting time up to 20secs at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be 3 second more than the starting time at minimum rated voltage(85%). For motors with starting time more than 20secs and up to 45secs at minimum voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be at least 5secs more than starting time at minimum rated voltage(85%). For motors with starting time more than 45secs at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at high voltage limit shall be more than starting time at minimum rated voltage(85%) by at least 10% of the starting time. Speed switch mounted on the motor shall be provided in cases where above requirements are not met.
- 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.
- Starting voltage requirement will be 85% of rated voltage up to 1500kw rating motor.
- Single phase space heaters suitable for 240 v AC shall be provided on motors rated 30kw and above to maintain winding in dry condition when motor is standstill. Separate terminal box for space heater (As per clause no: 5.3.2) and RTDs shall be provided.
- All motors shall be Totally Enclosed Fan Cooled (TEFC), for Motors below 30 kw, winding shall be suitable for heating at 24v, 1 phase AC.
- Winding and Insulation shall be of type Non-hygroscopic, Oil and Flame resistant. It shall be capable two hot starts in succession with initially at normal running temperature. The insulation shall be Class B or better.
- Noise level of all motor shall be limited to 85 dB(A). Vibration shall be limited within the limit prescribed by IS12075, Part-14. Motor shall withstand the



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vibration produced by driven equipment. Combined vibration of the equipment at site shall only be accepted as per the Schedule of Guarantee Clause, as mentioned in the data sheet.

- i. Motor body shall have two earthing points on opposite side.
- j. inside the terminal box to suit the conductor size
 - Motors up to 1 kw - 8 SWG wire
 - 1kw - 30 kw - 25x3 mm GI flat
 - 30 kw - 60 kw - 25x6 mm GI flat
 - 60 kw & above - 30x6 mm GI flat

5.3.2 Terminal Box

Motor MCR in KW	Minimum distance between centre of stud and gland plate in mm
UP to 3 KW	As per manufacturer's practice
Above 3 KW - upto 7 KW	85
Above 7 KW - upto 13 KW	115
Above 13 KW - upto 24 KW	167
Above 24 KW - upto 37 KW	196
Above 37 KW - upto 55 KW	249
Above 55 KW - upto 90 KW	277
Above 90 KW - upto 125 KW	331
Above 125 KW-upto 200 KW	203

Terminal boxes of LT motors 160 KW (& above) shall be capable of withstanding system fault level of 31 MVA for 0.12 second.

Ratio of locked rotor KVA at rated voltage to rated KW shall not exceed the following (without any tolerance)

- Upto 110KW : 11.0
- Above 110KW & upto 1500KW : 10.0
- Above 1500KW & upto 4000KW : 9.0
- Above 4000KW : 6 to 6.5

5.3.3 Testing of LT Motors

- a. LT Motors shall be of type tested quality. For each type and rating of LT Motors, rated above 50KW, the vendor shall submit for Owner's approval the report of all type tests as per relevant standards and carried out within last five (5) years from the date of Purchase Order(PO). These reports should be for the test conducted on the equipments similar to those proposed to be supplied under this contract, and the tests should have been either conducted at an independent laboratory or should have been witnessed by client.



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- b. In case vendor is not able to submit the report of the type tests, conducted within last five (5) years from the date of PO or in case the type tests report are not found to be meeting the specification requirements, the vendor shall conduct all such tests under this contract free of cost to the ultimate purchaser (END CUSTOMER in this case) and submit the reports for approval.
- c. 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.
- d. All Motors shall be so designed that maximum inrush currents and locked rotors and pull-out torque developed at extreme voltage and frequency variation do not endanger the motor and driven equipments.
- e. Terminal boxes of breaker operated LT Motors above 160kw shall be capable of withstanding system fault level 31MVA for 0.12 second.
- f. The size and number of cables to be intimated to successful bidder during detail engineering and the contractor shall provide terminal box suitable for the same.

6.0 GENERAL REQUIREMENTS:

S.No	Description
1.	Metric unit shall be used in the drawings and in the any displays on the equipment's. 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 meters from the source in any direction and 1.5m above operating floor.
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.	Corrosion allowance: Corrosion allowance for entire equipment shall be in accordance with latest applicable Indian / International standard.
10.	Unless otherwise specified , flanges shall be in accordance with ANSI B16.5 Class 150



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S.No	Description
11.	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.
12.	Rotation arrows shall be cast in or attached with stainless steel plate on each item of rotation equipment at a readily visible location.
13.	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.
14.	Skid Mount/Transportation: Equipment shall be fabricated as skid mount design as much as practical to minimize erection at the site.
15.	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.
16.	Bidder shall provide the necessary gaskets.
17.	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.
18.	Bidder to provide capacity of crane or hoist required for material handling and the details of heaviest component to be handled.
19.	The list of all Bought out items with makes and country of origin to be mentioned along with offer to be submitted.
20.	Quality Plan to be submitted along with the offer.
21.	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.
22.	Material of construction for all equipment/components shall be subject to END CUSTOMER/ BHEL approval during detail engineering. Accordingly bidder shall consider MOC for all equipment/component as per best engineering practice, global standard and global references.
23.	Bidder to provide sub vendor list and Bidder shall strictly adhere to END CUSTOMER 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 END CUSTOMER/ BHEL before placing order and bidder shall submit relevant documents to take up with END CUSTOMER for approval.
24.	It shall be the complete responsibility of the successful bidders to obtain "Sub Vendor Approval" from BHEL / END CUSTOMER for all equipment's & 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 END CUSTOMER/ BHEL, the same may be replaced with another END CUSTOMER/BHEL



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S.No	Description
	approved sub-vendor only, without any price implications to BHEL.
25.	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 END CUSTOMER and 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 END CUSTOMER along with BHEL.
26.	During detail engineering, bidder to strictly adhere to BHEL/END CUSTOMER drawing formats, document numbering, quality plan & FQP formats
27.	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.
28.	Complete detail engineering drawings, calculations, selection of components etc. shall be reviewed & subject to approval of BHEL/END CUSTOMER during detail engineering
29.	Bidder shall furnish necessary inputs & drawings of all equipment in editable Auto CAD/ MS-Word /Excel format.
30.	During detail engineering, successful bidder shall ensure flow of drawings/documents as per schedule. Any comments from BHEL/END CUSTOMER should be addressed timely by the bidder.
31.	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.
32.	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"



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S.No	Description
	b. "Not considered in scope of work"
7.0	PACKING AND FORWARDING
1.	Proper packing to be ensured. Indigenous Supply: Agitator & sub system assembly shall be wrapped in polythene bags & packed in a strong rigid wooden crate. Rain water should not enter into the Agitator internals during storage in the outer yard of power plant. Imported Supply: All imported supply should be packed as per Sea worthy packing standards PE-TS-888-100-A001. 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.
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.(END CUSTOMER)
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



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S.No	Description
8.	Each package or shipping units shall be clearly marked or stenciled on at least two sides as per the dispatch instruction gives during the contract: 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.
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 handling)
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 Agitator, 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



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S.No	Description
	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, 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.
8.0	SUPERVISION OF ERECTION, TESTING AND COMMISSIONING
1.	The erection of Agitators will be done by owner as per Erection Manual and check List. However, the bidder shall make visit as per enquiry/PO 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.	The bidder will be informed well in advance for the visit.
3.	All TA/DA, Site Expenses, Travel charges boarding and lodging shall be borne by the bidder and shall be inclusive in supervision portion.
4.	Price comparison for evaluating the lowest bid will be considered all main supply, supervision of E&C charges and mandatory spares price all together.
9.0	EXCLUSION
	The following work associated with the Agitators will be by others: a. Walkways, platforms and ladders b. Element handling hoists.
10.0	INSPECTION AND TESTING
	The 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 on the Agitators for review by BHEL/END CUSTOMER prior to manufacture.
2.	The Bidder shall furnish performance test procedure along with standard. The test procedure will be reviewed and approved by the BHEL/END CUSTOMER.
3.	Since there is no standard for “Acceptance Test Procedure” for Agitator, Agitator manufacturer is to submit a test procedure and Quality Plan, clearly indicating that equipment will meet the



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S.No	Description
	desired parameter.
4.	Power consumption at motor terminal and vibration of equipment will be conducted at site. Vendor to indicate other material tests that are to be conducted as per their practice in their Quality plan.
5.	No liquid should enter the tube through any flange joint. "O"-ring used in the flange joint will deteriorate at a highly chlorinated and acidic environment of medium at a maximum operating temperature unless right quality of rubber is used. Hydrostatic testing of tube assembly is required at a pressure of twice that of maximum liquid column in any tank or 30m whichever is higher. The hydro test duration will be for a minimum of 1 hr to check sweating at any flange. Hydrostatic test is meant in part for a check of equipment joint at new condition only. It cannot be considered as a guarantee of functional objective of rubber used.
6.	DYNAMICS
7.1	CRITICAL SPEED
7.1.1	Operation speed of the Agitator motor shall be at least 25% below the first critical speed
7.1.2	Additional to the requirement of the critical speed of Agitator, as specified above. Agitator manufacturer is to analyze the torsional critical speed of combined system of Agitator, Gear Box and Motor to establish that the torsional critical speed is well off the operating speed by 20% from the operating speed.
7.2	VIBRATION SEVERITY
7.2.1	During performance test, unfiltered vibration measurements shall be made with running of Agitator in Air. Measurement shall be taken on the Gear Box thrust bearing housings as well in motor top.
7.2.2	Guaranteed Site vibration of the equipment on its own pedestal, at commissioning with normal level of liquid and with maximum liquid at respective tank, Vibration limit at site will be as per ISO-10816, 1.5-2.3mm/sec even if Motor rating falls below 15kw.
7.2.3	Vibration measurements of bearing housing shall be made in root mean square (RMS) velocity.
7.2.5	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.
8.	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.
9.	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.



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S.No	Description
10.	Test certificates shall be issued for each lot of raw material used in the coating, corresponding to specific weight and traction resistance.
11.	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 adherence.
12.	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.
13.	Out of all Agitators One Number of each type will be inspected at the Bidder's works before dispatch or where the test facilities are available.
14.	The Bidder shall conduct performance test for the remaining Agitators and submit the reports.
15.	Contract shaft mechanical seals shall be used during shop tests, unless the seal design is unsuitable for the shop-test condition, if applicable.
16.	Agitators shall not be released for shipment, until shop tests data and performance tests curves have been approved by Owner.
17.	Bidder should furnish performance guarantee as per applicable standard guarantee for the design, manufacture, material and safe operation of the equipments.
18.	BHEL shall witness the test at Bidder's works and a notice of minimum three (3) weeks shall be given for attending the inspection.
19.	Bidder to arrange all calibrated gauges, Instruments during inspection.
20.	Mechanical running and the performance test shall be carried out. Bidder to arrange Motor of same / higher rating for the shop test and inspection.
11.0	PAINTING
1.	Painting details for agitator support:- Surface Preparation : Blast Cleaning SA 2.5 PRIMER COAT: a. Primer: One coat of Two component moisture curing zinc (ethyl) silicate primer coat (Min 80% metallic zinc content in dry film, solid by volume minimum 60% ±2). Zinc dust composition and properties shall be as per Type II as per ASTM D520-00 DFT- 70µ Intermediate : One coat of Two component polyamide cured epoxy with MIO content (containing lamellar MIO Min 30% on pigment, solid by volume min. 80%±2) DFT- 100µ . FINISH COAT: Two coats of two pack aliphatic isocyanate cured acrylic polyurethane paint to IS 13213 solid by volume min.55%±2) DFT- 35µ/ coat With gloss retention (SSPC paint spec no.36, ASTM D4587, D2244, D523 of level 2 after min. 1000 hrs exposure, gloss less than 30 and colour change less than 2.0Δ E) COLOUR CODE Base: To be informed during contract stage



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S.No	Description
	Lettering: To be informed during contract stage
2.	Rust preventive paint after inspection at shop floor before dispatch shall be in bidder's scope
3.	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 / END CUSTOMER.
12.0	SPARES,TOOLS & TACKLES
	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.
12.1	START UP & COMMISSIONING SPARES
	Start-up & Commissioning Spares shall be part of the main supply of the Agitators. 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 Agitator 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 equipment's are energized. The List of such spares to be provided during bidding stage
12.2	RECOMMENDED SPARES
	Bidders shall also furnish the 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
12.3	MANDATORY SPARES:



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S.No	Description
	Bidder to quote for the mandatory spares as per the Mandatory Spare list given for a specific project. 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 equipment's. 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.
13.0	PERFORMANCE GUARANTEE
	All performance tests for Agitators shall be carried out in accordance with any latest international codes/standards. Bidder shall furnish Performance guarantee for the design, manufacture, material, safe and trouble-free operation of the Agitators and its accessories 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. Noise level ≤ 85 dB (A) at 1m horizontal distance from equipment/enclosures and 1.5m above operating floor is to be guaranteed. 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. Acceptance tests to be carried out as per the procedure defined by the bidder which shall be submitted for BHEL/ END CUSTOMER approval. 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.
14.0	BID EVALUATION CRITERIA FOR POWER CONSUMPTION:
1.	POWER GUARANTEE
	Bidder to specify the total guaranteed power per Agitators (i.e. power consumed at Motor input



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S.No	Description
	terminal at normal liquid level) operating at the rated capacity in their offer.
2.	BID EVALUATION CRITERIA FOR POWER CONSUMPTION: Only agitators which are in continuous operation will be considered for power consumption. The best of the parameter for auxiliary power consumption quoted by any qualified bidder shall be taken as the base or ceiling value. Bid prices of other bidders will be loaded for every KW excess over the ceiling value as per the formula given below. Adjustment factor for excess power consumption = $(GPC-BV) \times PL \times \text{No's of Working Agitators}$ GPC- Guaranteed Power Consumption quoted by bidder in KW BV- base Value i.e. lowest quoted power consumption in KW PL- Power Loading per KW . However, the maximum value of power loading will be limited to 10% of the equipment value.
15.0	LIQUIDATED DAMAGES FOR POWER CONSUMPTION
	If actual Power Consumption 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 = $(APC-GPC) \times P \times \text{Total no of Working agitators}$ Where GPC- Guaranteed Power Consumption quoted by bidder in KW APC- Actual Power Consumption in KW N- Total Number of Agitators P- Penalty per KW Note : 1. LD will be levied after conducting performance test as above subjected to the maximum 10% of the main equipment value. LD will be adjusted from the pending bills payable to the bidder. 2.For conducting PG test at project site for demonstrating the guaranteed parameters of pump, vendor has to make own arrangement for TA/DA and hotel charges, which is to be considered while submitting the offer.
16.0	WARRANTY/DEFECT LIABILITY
1.	The Bidder warrants that the equipment's/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 Warranty Period shall be twenty four (24) months from the date of Supply or eighteen (18) months from the date of commissioning, whichever first occurs. If during the Warranty/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



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S.No	Description
	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, END CUSTOMER/BHEL reserves the right to reject the equipment. However, END CUSTOMER/BHEL reserves the right to use the equipment until new equipment supplied by bidder meets the guaranteed requirement .
17.0	FIRST FILL OF CONSUMABLES:
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 END CUSTOMER/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 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.
18.0	TRAINING
	Successful bidder shall provide comprehensive training for END CUSTOMER/BHEL Engineering, O&M, Erection & Commissioning staffs at site covering all aspects of the Agitators - Operation & Maintenance, Troubleshooting etc.
19.0	CONFLICT
	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 END CUSTOMER 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.
20.0	DOCUMENTATION
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 Offer. Vendors are requested to comply with above in all respect.



TECHNICAL SPECIFICATION OF AGITATORS

FGD:AGITATORS:R00

S.No	Description
B	DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT
	The Successful bidder shall submit necessary data, documents and drawings for review, approval as specified in this specification. Drawings that are reviewed by the END CUSTOMER/ 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. END CUSTOMER/ 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 END CUSTOMER 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 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 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 END CUSTOMER requirement for all engineering drg/doc and for all subsequent revisions along with a soft copy through email to concerned project team.



TECHNICAL SPECIFICATION OF AGITATORS

FGD:AGITATORS:R00

ANNEXURE-I – REFERENCE LIST

Project :

Enquiry No :

REFERENCE LIST as per format shown below. (Reference plant details for Horizontal and Vertical Agitators)

S.No	Project Name , Customer & Plant capacity	Coal fired Yes/No	Wet Limest one Based FGD Yes/No	Model	Size of Tank	Type / Hor / Vertical	Speed rpm	Year of Commg	Qty

Note :

Bidders shall also submit reference list of Horizontal /Vertical agitators as per the format given above.

BIDDER SIGN : _____

DESIGNATION : _____

DATE : _____

BIDDER SIGN WITH SEAL AND DATE:



TECHNICAL SPECIFICATION OF AGITATORS

FGD:AGITATORS:R00

Annexure-II TECHNICAL DATASHEET OF AGITATORS (TO BE FILLED FOR EACH AGITATOR)

Project :

Enquiry No :

Sl.no	General	Units	DATA
1.1	Project		
1.2	Ultimate Customer		
1.3	Location		
1.4	Order Number/Enquiry No		
1.5	Agitator Name		
1.6	Service		
1.7	Installation		
1.8	No. of Agitator per Tank		
1.9	Total No's of Agitator for all the units		
1.10	Type of Agitator		TOP ENTRY/SIDE ENTRY
1.11	Model Number		
1.12	No of Stage(No of propeller per Agitator)		
1.13	Mounting of Agitator		
1.14	Mounting of Gear Head		
1.15	Mounting of Motor		
2	Performance Details		
a.	Input power at Motor terminal at highest frequency and Maximum liquid level in tank	KW	
b.	Input power at Motor terminal at Normal frequency (50Hz) and Normal liquid level in tank	KW	
c.	Motor rating	KW	
d.	Rated speed	rpm	
e.	Critical Speed	rpm	
f.	Tip speed	m/s	
g.	Direction of rotation of Motor and Gear box viewed from Motor non-driving end		
h.	Direction of rotation of Agitator viewed from Gear head end		
i.	Minimum submergence required over blade centre line for continuous operation	mm	



TECHNICAL SPECIFICATION OF AGITATORS

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j,	Impeller diameter	mm	
k.	Minimum clearance required below impeller centre line	mm	
l.	Maximum liquid level over propeller centre line up to which Agitator can work without overloading of motor at 50Hz	mm	
3	Construction Features		
3.1	Impeller		
	a) Type		
	b) Diameter(tip to tip)	mm	
	c) Hub diameter	mm	
	d) No of blade per Impeller		
	e) Thickness of blade	mm	
3.2	Tube thickness, if any	mm	
3.3	Shaft diameter at coupling (GH-Agitator)	mm	
3.4	Length of Top shaft	mm	
3.5	Connection Details		
	· Blade to Hub:		
	· Hub to Shaft/Tube		
	· Line Shaft to Line shaft		
	· Line shaft to top shaft		
3.6	Bearings in Gear Head		
	Thrust bearings Housing		
	a) Type		
	b) Make		
	Bearing Number		
	· Radial Bearing		
	· Radial Bearing		
	· Thrust Bearing		
	c) Type of lubrication		
	d) Lubricator		
3.7	Coupling between Agitator & Gear Head		
	a) Type		
	b) Make & Model No.		
	c) Rating	KW/rpm	
3.8	Stuffing Box/Mechanical Seal		
	a) Type		
	b) Details of gland packing		
	c) No of packing		
	d) Cooling water		
	e) Lubrication type		
	f) Qty of grease and interval of lubrication.		
4	Material of Construction		
a.	Blade of Impeller		
b.	Hub of Impeller		
c.	Base Plate/Gear head Stand		
d.	Line Shaft & Line shaft Coupling		



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e.	Impeller Shaft		
f.	Top Shaft		
g.	Gland Sleeve		
h.	Location of Thrust bearing		
i.	Coupling guard		
j.	Fasteners in Wet region		
k.	Fasteners in Dry region		
l.	Stuffing Box		
m.	Gland		
n.	Gland packing		
5	Weight		
	a) Bare Agitator weight Kgs		
	b) Rotating Assembly weight Kgs		
	c) Motor weight Kgs		
	d) Gear Head weight Kgs		
	e) Wt. of the equipment, (a+c+d)		
	f) Heaviest single piece component of Agitator to be handled. Kgs		



TECHNICAL SPECIFICATION OF AGITATORS

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Annexure-III MOTOR SIZING CALCULATION (TO BE FILLED FOR EACH AGITATOR)

Project :

Enquiry No :

S.No	Parameters		Data
1	Tank size (Dimension in m)		
2	Specific Gravity of Slurry	ρ	
3	IMPELLER TIP DIA(in m)	d	
4	AGITATOR SPEED(RPM)	n	
5	POWER NO OF THE AGITATOR	N_p	
6	NO OF IMPELLER STAGES	I	
7	AGITATOR POWER(P)	$N_p * \rho * d^5 * n^3 * I$	
8	GEARBOX EFFICIENCY	η_1	
9	BEARING TRANSMISSION EFFICIENCY	η_2	
10	EFFICIENCY DUE TO ANY OTHER LOSSES	η_3	
11	MECHAINCAL POWER REQUIRED(X)	$X = P / (\eta_1 * \eta_2 * \eta_3)$	
12	MOTOR EFFICIENCY	η	
13	Rated Input Power at Motor Terminal at Normal water level and at Normal voltage and Frequency or Agitator BKW	$\text{Agitator BKW} = X / \eta$	
14	MOTOR POWER (KW)	Motor margin shall be designed as per the following guidelines : a) If Agitator Rated BKW <22KW , the Motor Rating shall be 125% of Agitator Rated BKW b) If Agitator Rated BKW from 22KW to 55KW , then Motor Rating shall be 115% of Agitator Rated BKW c) If Agitator Rated BKW >55KW , then Motor Rating shall be 110% of Agitator Rated BKW	



TECHNICAL SPECIFICATION OF AGITATORS

FGD:AGITATORS:R00

Annexure-IV MOTOR DATASHEET FOR AGITATORS (TO BE FILLED FOR EACH AGITATOR)

Project :

Enquiry No :

SLNO	Description	DATA
A.	GENERAL	
1.	Manufacturer & Country of origin.	
2.	Equipment driven by motor	"Name of the Agitator"
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(IE3)	
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	



TECHNICAL SPECIFICATION OF AGITATORS

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	b. No load current	
16.	Power Factor at	
	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.	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	



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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)	
6.	Grounding pads	
	i) No and size on motor body	
	ii) Nos on terminal Box	
7.	Any other fitments	



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E.	List of curves.	
	Torque speed characteristic of the motor	
	Thermal withstand characteristic	
	Starting. current Vs. Time	
	Starting. current Vs speed	
	P.F. and Effi. Vs Load	



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FGD:AGITATORS:R00

Annexure-V -Schedule of Guarantees (TO BE FILLED FOR EACH AGITATOR)

Project:

Enquiry No:

Agitator Name:

Sl. No.	Description	Unit	Data
1	Rated Input Power at Motor Terminal at Normal water level and at Normal voltage and Frequency (*)	KW	
2	Possible Rate of deposit of solid particles at tank bottom of total solid particle inflow/outflow	%	
2	Noise level at a distance of 1.0 meter from the equipment at site	dB(A)	85
3	Maximum vibration velocity at site) (RMS)	mm/sec	
4	Life of Agitator components parts from the date of Commissioning for continuous operation		24 months
5	Anti-friction Bearing		25000 hrs.

BIDDER SIGN : _____

DESIGNATION : _____

DATE : _____



TECHNICAL SPECIFICATION OF AGITATORS

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Annexure-VI-- LIST OF DEVIATIONS OR EXCEPTIONS TO THE ENQUIRY DOCUMENT

Project :

Enquiry No:

*We hereby accept to the Technical Specification for agitators and **all the parameters for this project**

SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----

(OR)

*The following are the technical deviations to the specification:

SI No	Clause No	Page No	Description of Deviation

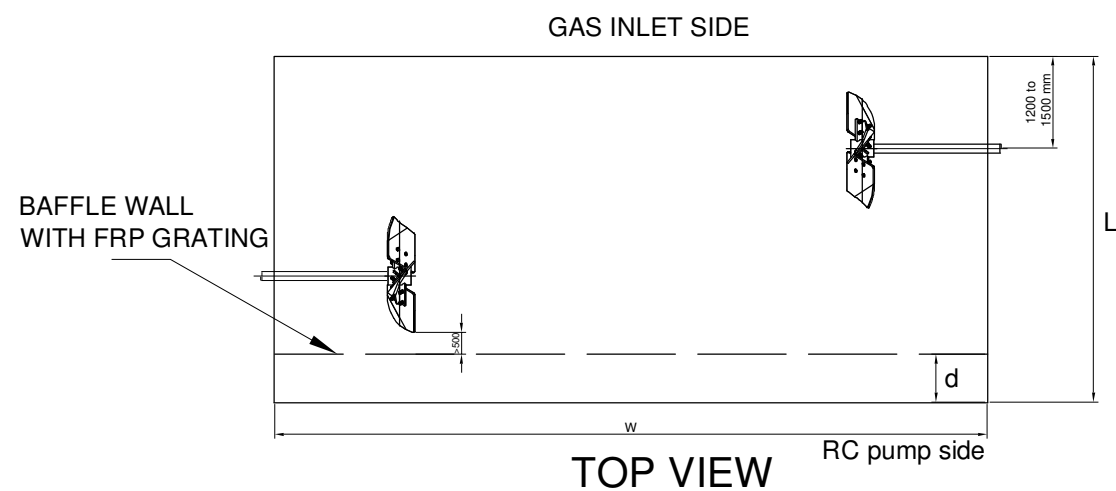
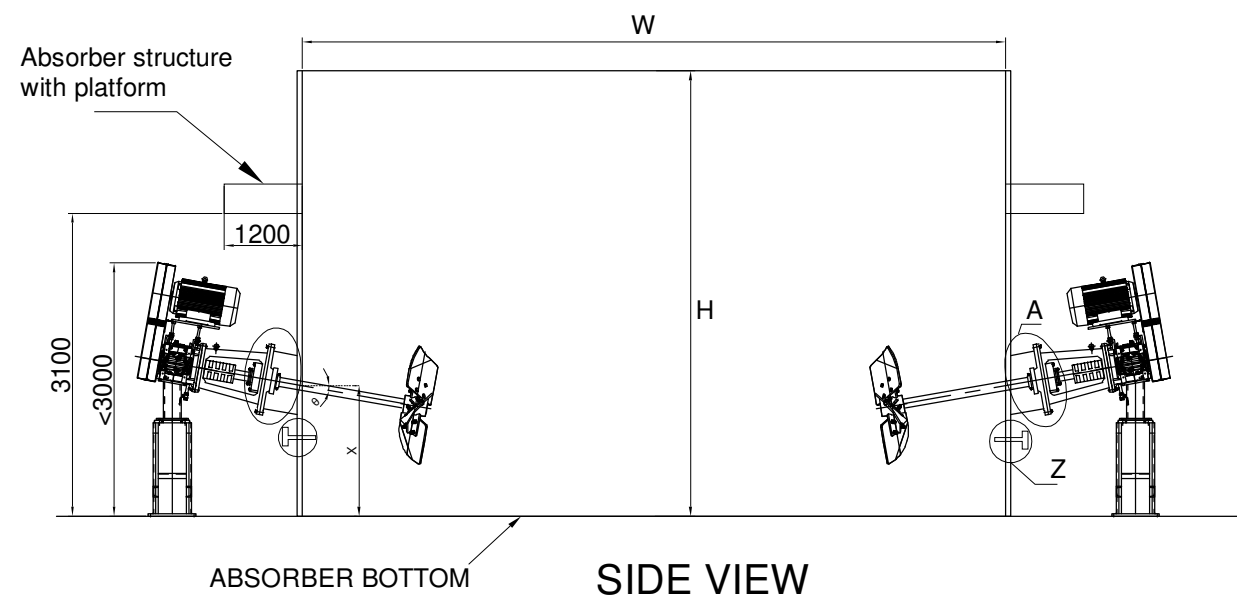
SIGNATURE OF BIDDER -----

NAME -----

DESIGNATION -----

*Strike out whichever is not applicable

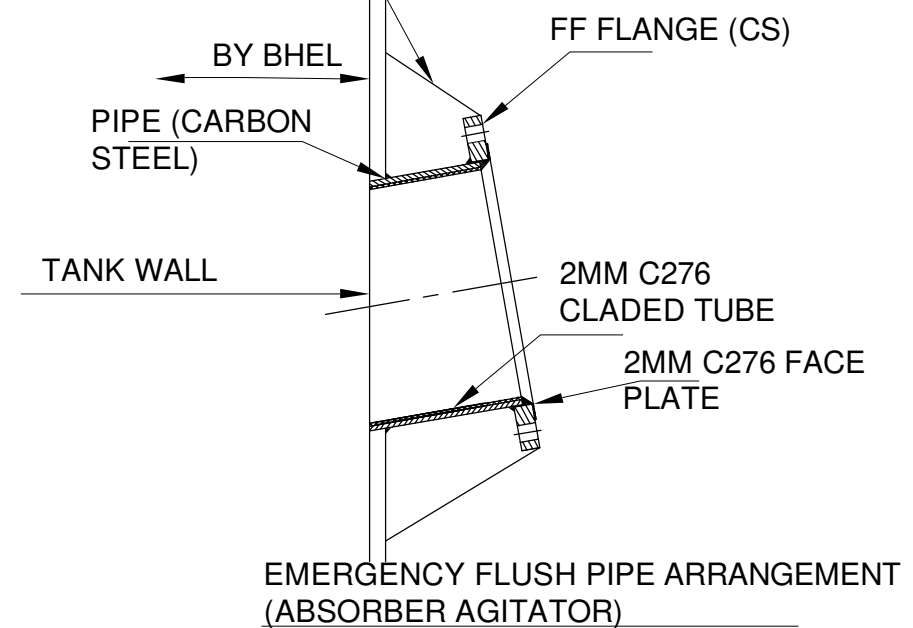
BIDDER SIGN WITH SEAL AND DATE:

**NOTE-**

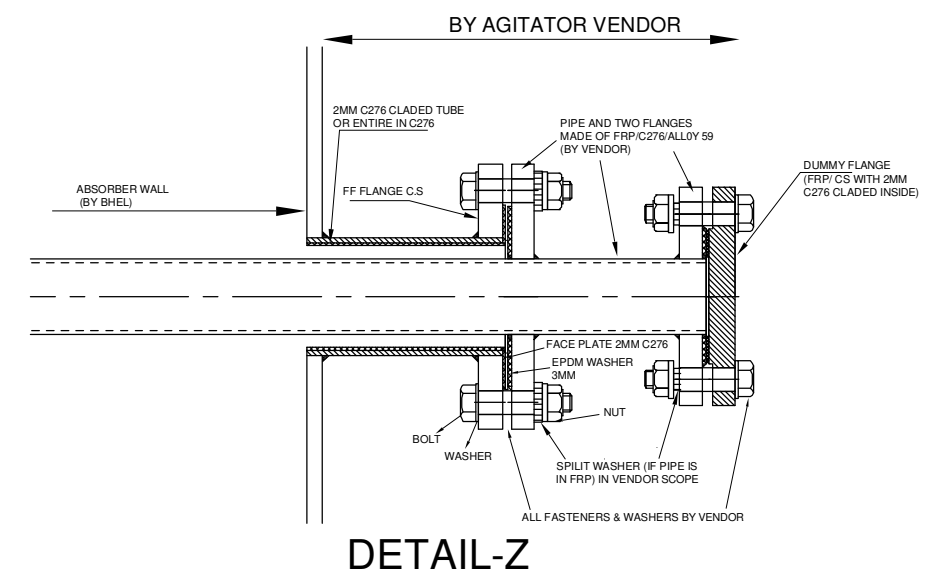
- 1- ALL DIMENSIONS ARE IN MM.
- 2- TYPICAL ARRANGEMENT IS SHOWN WITH V BELT & PULLEY. VENDOR CAN ALSO OFFER GEAR BOX DRIVEN AGITATOR.
- 3- FOR TANK HEIGHT (H), WIDTH(W) AND LENGTH(L), BIDDER SHALL REFER TO BE TECHNICAL INFORMATION OF AGITATORS.
- 4- BAFFLE WALL IS LOCATED AT A DISTANCE 'd' FROM THE ABSORBER WALL
IF $L < \text{or} = 9900 \text{ MM}$, THEN $d = 2200 \text{ MM}$
 $L > 9900 \text{ MM}$, THEN $d = (L-8000) \text{ MM}$
THE ABSORBER AGITATOR SHALL BE DESIGNED TO PREVENT THE SLURRY SETTLEMENT AT BOTTOM OF THE ENTIRE TANK INCLUDING THE AREA BETWEEN THE BAFFLE WALL AND THE ABSORBER WALL.
- 5- THE AGITATOR LOCATION SHALL BE SUGGESTED BY VENDOR CONSIDERING THE LOCATION OF THE BAFFLE WALL. BAFFLE WALL IS MADE OF FRP GRATINGS, VENDOR TO INDICATE THE VALUE OF X AND θ .

GUSSET PLATE IN
VENDOR SCOPE.**DETAIL-A**

BY AGITATOR VENDOR



FLAT FACE SHEET ON THIS C276 CLADDING FLANGE SHALL ACT AS RAISED FACE. OD OF C276 SHEET ON THE FLANGE SHALL BE EQUAL TO ASME B16.5 CLASS 150.

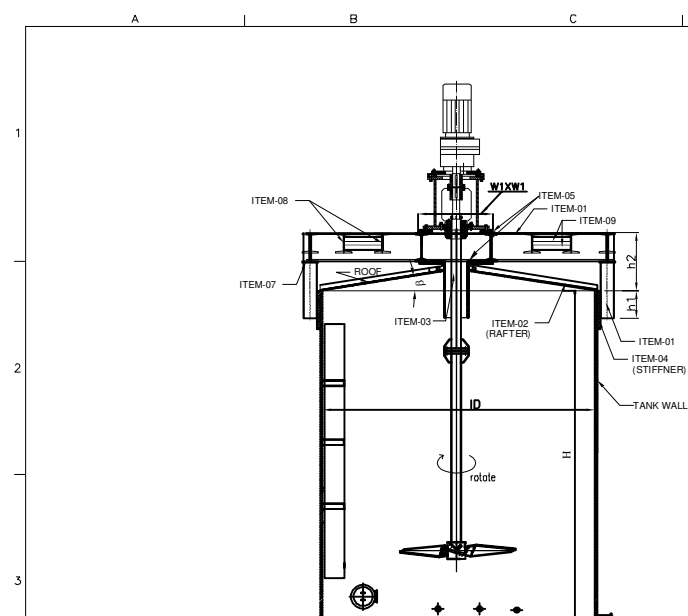


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CUSTOMER/PROJECT:NTPC LIMITED / FGD SYSTEM PACKAGE						
	Bharat Heavy Electricals Ltd		DRN	NAME	DATE	NO. OF VAR
	BOILER AUXILIARIES PLANT			S. SHANMUGA SUNDARAM	29/08/2020	—
	RANIPET-632 406					
	TITLE:			SCALE		
	TYPICAL ARRANGEMENT OF SIDE ENTRY AGITATOR IN ABORBER TANK			 N.T.S.		
NTPC DRG. NO:			BHEL DRG NO:		REV	

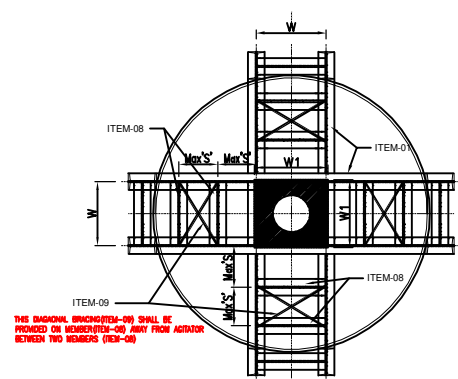
A3

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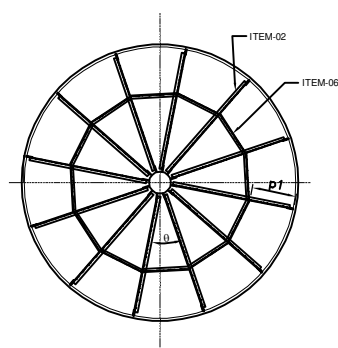


TYPICAL AGITATOR SUPPORT IN TANK

REV: 00
DATE: 01.10.2019
SHEET: 01/01

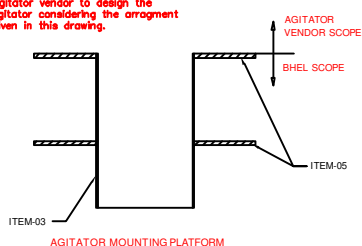


AGITATOR SUPPORT DETAILS



ROOF STIFFENER DETAILS

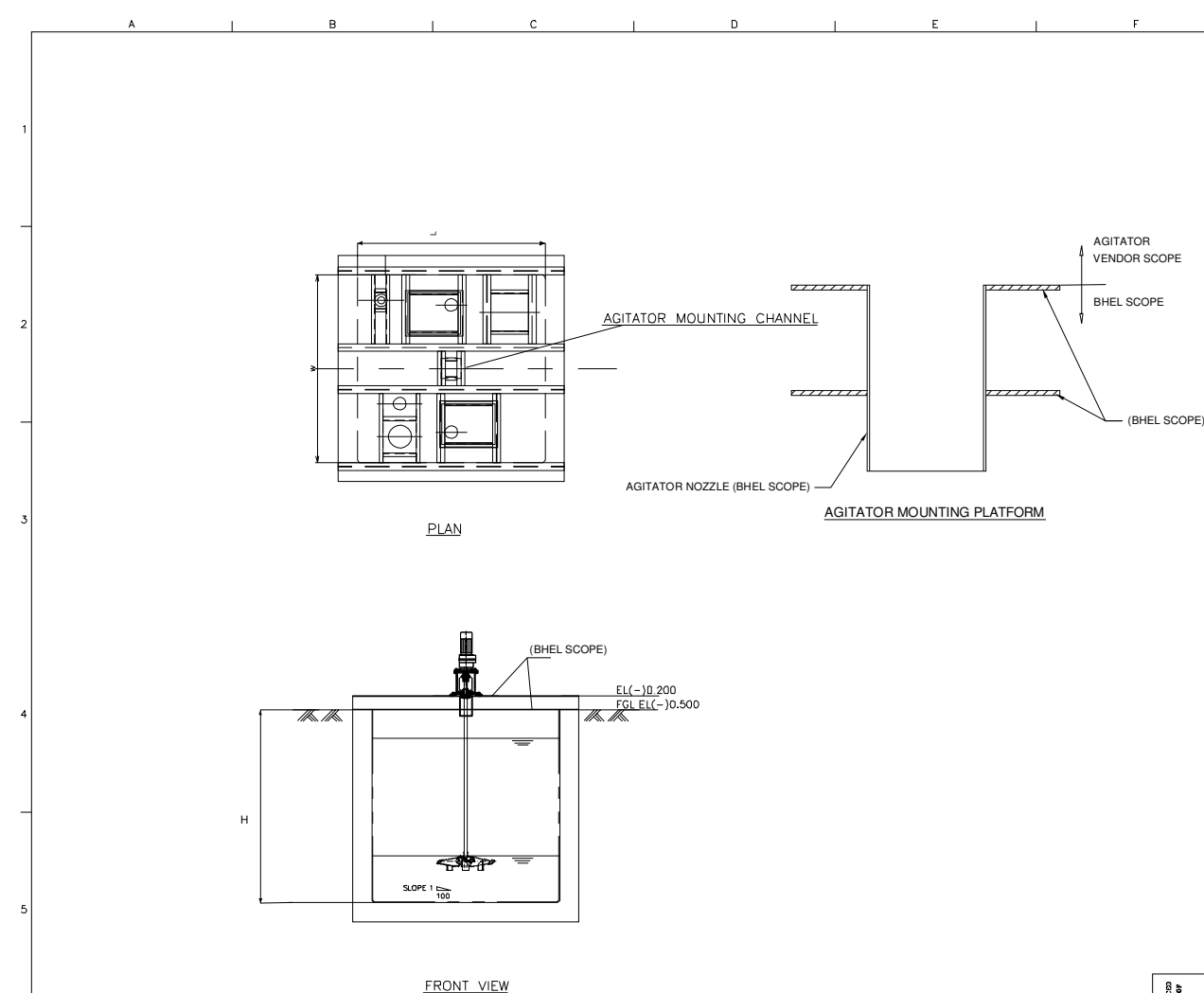
ITEM-05 is in BHSL scope and it is welded to agitator structure at the top of the tank nozzle. Agitator vendor to design the agitator considering the arrangement given in this drawing.



AGITATOR MOUNTING PLATFORM

*- UPTO TOP OF ITEM -05 ** - SHALL BE AT EQUAL INTERVALS

Sl.NO	Tank-ID	h1	h2	p1	S**	W&B	W1	item-1	item-2	item-3		item-4		item-5	item-6	item-7	item-8	item-9	θ	β
										Desc.	Height (Ht)	Height x Width x Thk.								
1	UPTO 3000	650	650	NA	NA	600	650	UB-305	MC100	ERW323.9X4.0	700	850x650x10	PL32	NA	PL20	UB203	NA	60°	5°	
2	3001 to 6000	1000	1000	1000	2000	600	650	UB-406	MC150	ERW323.9X4.0	950	1150x578x10	PL32	MC75	PL20	UB203	NA	45°	5°	
3	6001 to 9000	1200	1200	1500	1800	800	850	NPB-500	MC250	ERW323.9X4.0	1000	1400x600x10	PL32	MC75	PL20	UB305	ISA75X75X8	45°	5°	
4	9001 to 13000	1700	1700	2000	1500	1000	1050	NPB-600	MC400	ERW508X4.8	1350	1700x620x10	PL40	MC75	PL25	UB305	ISA75X75X8	20°	5°	
5	13001 to 16000	1900	1900	2000	1200	1250	1250	NPB-600	MC400	ERW508X4.8	1400	2100x620x10	PL45	MC75	PL32	UB406	ISA75X75X8	20°	5°	

[illegible]

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 THIS AGREEMENT WITH COMPANY

CUSTOMER: NTPC LIMITED.			FGD SYSTEM PACKAGE		
	BHARAT HEAVY ELECTRICALS LIMITED,	DEPT.	NAME (BHEL)	DATE	
	UNIT: BOILER AUXILIARIES PLANT,	CODE			
	BHUPATNAGAR, INDIA.	ORN	S.SHAHNUGA SUNDARAM	05.11.2011	
	BHUPATNAGAR, INDIA.	M			
TITLE:					
TYPICAL ARRANGEMENT OF TOP ENTRY AGITATOR IN DRAIN SUMP					
				SCALE: 1/10	
NTPC DRG NO:					
BHEL DRG NO		FILE NO		REV NO	

FOR MOTORS	
	MOTORS
1.00.00	GENERAL REQUIREMENTS
1.01.00	For the purpose of design of equipment/systems, an ambient temperature of 50 deg. Centigrade and relative humidity of 95% (at 40 deg C) shall be considered. The equipment shall operate in a highly polluted environment.
1.02.00	All equipment's 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.
1.03.00	Contactor shall provide fully compatible electrical system, equipment's, accessories and services.
1.04.00	All the equipment, material and systems shall, in general, conform to the latest edition of relevant National and international Codes & Standards, especially the Indian Statutory Regulations.
1.05.00	Paint shade shall be as per RAL 5012 (Blue) for indoor and outdoor equipment.
1.06.00	The responsibility of coordination with electrical agencies and obtaining all necessary clearances for Contactors equipment and systems shall be under the Contactor scope.
1.07.00	Degree of Protection
	Degree of protection for various enclosures as per IEC60034-05 shall be as follows :-
	i) Indoor motors - IP 54
	ii) Outdoor motors - IP 55
	iii) Cable box-indoor area - IP 54
	iv) Cable box-Outdoor area - IP 55
2.00.00	CODES AND STANDARDS
	1) Three phase induction motors : IS/IEC:60034
	2) Single phase AC motors : IS/ IEC:60034
	3) Crane duty motors : IS:3177, IS/IEC:60034
	4) DC motors/generators : IS:4722, IS/IEC:60034
	5) Energy Efficient motors : IS 12615, IEC:60034-30



6.01.03	For motors with starting time more than 45 secs. at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be more than starting time by at least 10% of the starting time.
6.01.04	Speed switches mounted on the motor shaft shall be provided in cases where above requirements are not met.
6.02.00	Torque Requirements
6.02.01	Accelerating torque at any speed with the lowest permissible starting voltage shall be at least 10% motor full load torque.
6.02.02	Pull out torque at rated voltage shall not be less than 205% of full load torque. It shall be 275% for crane duty motors.
6.03.00	Starting voltage requirement
	(a) Up to 85% of rated voltage for ratings below 110 KW
	(b) Up to 80% of rated voltage for ratings from 110 KW to 200 KW
	(c) Up to 85% of rated voltage for ratings from 201 KW to 1000 KW
	(d) Up to 80% of rated voltage for ratings from 1001 KW to 4000 KW
	(e) Up to 75 % of rated voltage for ratings above 4000KW
7.00.00	DESIGN AND CONSTRUCTIONAL FEATURES
7.01.00	Suitable single phase space heaters shall be provided on motors rated 30KW and above to maintain windings in dry condition when motor is standstill. Separate terminal box for space heaters & RTDs shall be provided. However for flame proof motors, space heater terminals inside the main terminal box may be acceptable.
7.02.00	All motors shall be either Totally enclosed fan cooled (TEFC) or totally enclosed tube ventilated (TETV) or Closed air circuit air cooled (CACA) type. However, motors rated 3000KW or above can be Closed air circuit water cooled (CACW). The method of movement of primary and secondary coolant shall be self-circulated by fan or pump directly mounted on the rotor of the main motor as per IEC 60034-6. However VFD driven motors can be offered with forced cooling type with machine mounted fan or pump driven by separate electric motor. Motors and EPB located in hazardous areas shall have flame proof enclosures conforming to IS:2148 as detailed below (a) Fuel oil area : Group – IIB (b) Hydrogen generation : Group - IIC or (Group-I, Div-II as per plant area NEC) or (Class-1, Group-B, Div-II as per NEMA /IEC60034)



7.03.00	Winding and Insulation (a) Type : Non-hygroscopic, oil resistant, flame resistant (b) Starting duty : Two hot starts in succession, with motor initially at normal running temperature. (c) 11kV & 3.3 kV AC motors : Thermal class 155 (F) insulation. The winding insulation process shall be total Vacuum Pressure Impregnated i.e resin poor method. The lightning Impulse & interturn insulation surge withstand level shall be as per IEC-60034 part-15. (d) 240VAC, 415V AC & 220V DC motors : Thermal Class (B) or better
7.04.00	Motors rated above 1000KW shall have insulated bearings to prevent flow of shaft currents.
7.05.00	Motors with heat exchangers shall have dial type thermometer with adjustable alarm contacts to indicate inlet and outlet primary air temperature.
7.06.00	Noise level for all the motors shall be limited to 85 dB(A) except for BFP motor for which the maximum limit shall be 90dB(A). Vibration shall be limited within the limits prescribed in IS:12075 / 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.
7.07.00	In HT motors, at least four numbers simplex / two numbers duplex platinum resistance type temperature detectors shall be provided in each phase stator winding. Each bearing of HT motor shall be provided with dial type thermometer with adjustable alarm contact and preferably 2 numbers duplex platinum resistance type temperature detectors.
7.08.00	Motor body shall have two earthing points on opposite sides.
7.09.00	11 KV motors shall be offered with Separable Insulated Connector (SIC) as per IEEE 386. The offered SIC terminations shall be provided with protective cover and trifurcating sleeves. SIC termination kit shall be suitable for fault level of 25 KA for 0.17 seconds.
7.10.00	3.3 KV motors shall be offered with dust tight phase separated double walled (metallic as well as insulated barrier) Terminal box. Employer shall provide termination kit for the offered Terminal box. The offered Terminal Box shall be suitable for fault level of 250 MVA for 0.12 sec. Removable gland plates of thickness 3 mm (hot/cold rolled sheet steel) or 4 mm (non magnetic material for single core cables) shall be provided.

7.11.00	The spacing between gland plate & centre of terminal stud shall be as per Table-I.
7.12.00	All motors shall be so designed that maximum inrush currents and locked rotor and pullout torque developed by them at extreme voltage and frequency variations do not endanger the motor and driven equipment.
7.13.00	The motors shall be suitable for bus transfer schemes provided on the 11kV, 3.3 kV /415V systems without any injurious effect on its life.
7.14.00	For motors rated 2000 KW & above, neutral current transformers of PS class shall be provided on each phase in a separate neutral terminal box.
7.15.00	The size and number of cables (for HT motors) to be intimated to the successful Contactor during detailed engineering and the Contactor shall provide terminal box suitable for the same.
8.00.00	The ratio of locked rotor KVA at rated voltage to rated KW shall not exceed the following (without any further tolerance): (a) From 50KW & upto 110KW : 11.0 (b) From 110 KW & upto 200 KW : 9.0 (c) Above 200 KW & upto 1000KW : 10.0 (d) From 1001KW & upto 4000KW : 9.0 (e) Above 4000KW : 6 to 6.5
10.00.00	TYPE TEST
10.01.00	HT MOTORS
10.01.01	The Contactor shall carry out the type tests as listed in this specification on the equipment to be supplied under this contract. The Contactor shall indicate the charges for each of these type tests separately in the relevant schedule of Section - VII- (BPS) and the same shall be considered for the evaluation of the bids. The type tests charges shall be paid only for the test(s) actually conducted successfully under this contract and upon certification by the Employer's engineer.
10.01.02	The type tests shall be carried out in presence of the Employer's representative, for which minimum 15 days notice shall be given by the Contactor. The Contactor shall obtain the Employer's approval for the type test procedure before conducting the type test. The type test procedure shall clearly specify the test set-up, instruments to be used, procedure, acceptance norms, recording of different parameters, interval of recording, precautions to be taken etc. for the type test(s) to be carried out.
10.01.03	In case the Contactor has conducted such specified type test(s) within last ten years as on the date of bid opening, he may submit during detailed engineering

10.01.04	the type test reports to the Employer for waiver of conductance of such test(s). These reports should be for the tests conducted on the equipment similar to those proposed to be supplied under this contract and test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client. The Employer reserves the right to waive conducting of any or all the specified type test(s) under this contract. In case type tests are waived, the type test charges shall not be payable to the Contactor. Further the Contactor shall only submit the reports of the type tests as listed in "LIST OF TESTS FOR WHICH REPORTS HAVE TO BE SUBMITTED" and carried out within last ten years from the date of bid opening. These reports should be for the test conducted on the equipment similar to those proposed to be supplied under this contract and the test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client. However if the Contactor is not able to submit report of the type test(s) conducted within last ten years from the date of bid opening, or in the case of type test report(s) are not found to be meeting the specification requirements, the Contactor shall conduct all such tests under this contract at no additional cost to the Employer either at third party lab or in presence of client/Employers representative and submit the reports for approval.
10.01.05	LIST OF TYPE TESTS TO BE CONDUCTED The following type tests shall be conducted on each type and rating of HT motor (a) No load saturation and loss curves upto approximately 115% of rated voltage (b) Measurement of noise at no load. (c) Momentary excess torque test (subject to test bed constraint). (d) Full load test(subject to test bed constraint) (e) Temperature rise test at rated conditions. During heat run test, bearing temp., winding temp.,coolant flow and its temp. shall also be measured. In case the temperature rise test is carried at load other than rated load, specific approval for the test method and procedure is required to be obtained. Wherever ETD's are provided, the temperature shall be measured by ETD's also for the record purpose.
10.01.06	LIST OF TESTS FOR WHICH REPORTS HAVE TO BE SUBMITTED The following type test reports shall be submitted for each type and rating of HT motor (a) Degree of protection test for the enclosure followed by IR, HV and no load run test.

	(b) Terminal box-fault level withstand test for each type of terminal box of HT motors only. (c) Lightning Impulse withstand test on the sample coil shall be as per clause no. 4.3 IEC-60034, part-15 (d) Surge-withstand test on inter-turn insulation shall be as per clause no. 4.2 of IEC 60034, part-15
10.02.00	LT Motors
10.02.01	LT Motors supplied shall be of type tested design. During detailed engineering, the Contactor shall submit for Employer's approval the reports of all the type tests as listed in this specification and carried out within last <i>ten</i> years from the date of bid opening. These reports should be for the test conducted on the equipment similar to those proposed to be supplied under this contract and the test(s) should have been either conducted at an independent laboratory or should have been witnessed by a client.
10.02.02	However if the Contactor is not able to submit report of the type test(s) conducted within last ten years from the date of bid opening, or in the case of type test report(s) are not found to be meeting the specification requirements, the Contactor shall conduct all such tests under this contract at no additional cost to the Employer either at third party lab or in presence of client/Employers representative and submit the reports for approval.
10.02.03	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(Shall be limited as per clause no 7.06.00 of this section)

10.03.00 10.04.00	10. Test for degree of protection and 11. Overspeed 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.

TABLE - I

DIMENSIONS OF TERMINAL BOXES FOR LV MOTORS

Motor MCR in KW of	Minimum distance between centre of stud and gland plate in mm As per manufacturer's practice.
-------------------------------	--

UP to 3 KW

Above 3 KW - upto 7 KW	85
Above 7 KW - upto 13 KW	115
Above 13 KW - upto 24 KW	167
Above 24 KW - upto 37 KW	196
Above 37 KW - upto 55 KW	249
Above 55 KW - upto 90 KW	277
Above 90 KW - upto 125 KW	331
Above 125 KW-upto 200 KW	203

For HT motors the distance between gland plate and the terminal studs shall not be less than 500 mm.

PHASE TO PHASE/ PHASE TO EARTH AIR CLEARANCE:

NOTE: Minimum inter-phase and phase-earth air clearances for LT motors with lugs installed shall be as follows:

Motor MCR in KW	Clearance
UP to 110 KW	10mm
Above 110 KW and upto 150 KW	12.5mm
Above 150 KW	19mm

[Type here]



QUALIFICATION REQUIREMENT FOR AGITATORS OF MAHAGENCO BHUSWAL (1X660 MW)

AGITATORS : QR- 3K : BHUSAWAL

ANNEXURE- 3K : Qualifying Requirements for Agitators

The following terminology shall be followed for 3K Document:

- a) Bidder means BHEL
- b) Bidder's sub-vendor means Agitator Manufacturer.
- c) Employer or owner means MAHAGENCO

Agitator Vendor shall meet the below qualification requirement of MAHAGENCO .

MAHAGENCO CLAUSE NO	DESCRIPTION			
21.1.1 (a)	The Bidder / Bidder's sub-vendor(s) is required to meet the provenness criteria and/or qualification requirement for critical equipments, auxiliaries, systems and bought out items as per criteria stipulated below			
(b)	Agitators for the Wet Limestone based Flue Gas Desulphurisation (FGD) System offered by the Bidder shall be only from such manufacturer(s) who has previously manufactured and supplied the respective equipment(s) of the type, application and minimum equipment rating as stipulated below such that the respective equipment(s) should have been in successful operation in at least one (1) plant for a period not less than one(1) year reckoned as on 30 th June 2019:			
	Type and Rating for Qualification			
	Name of Equipment	Type of Equipment	Application	Equipment Rating
	Agitators	Horizontal	Wet Limestone based FGD application in Coal fired power plant (or) Similar process/duty application in petrochemical or metals and mining industry	Agitator rating not less than that supplied for 500 MW or higher size unit for similar application (or) Agitator supplied to tanks and handling 650 m3 slurry for each agitator with slurry concentration $\geq 30\%$ and density ≥ 1220 kg/m3
21.1.2	A JV / Subsidiary Company formed for manufacturing and supply of equipment(s) as listed at clause no.21.1.1 above in India, shall also be considered qualified for manufacturing such equipment(s), provided that it has a valid collaboration or licensing agreement for design, engineering, manufacturing of such equipment(s) in India with a qualified equipment manufacturer who meets the requirements stipulated at clause 21.1.1 above (or the technology provider of the qualified equipment manufacturer) for the respective equipment(s). Before taking up the			

[Type here]



QUALIFICATION REQUIREMENT FOR AGITATORS OF MAHAGENCO BHUSWAL (1X660 MW)

AGITATORS : QR- 3K : BHUSAWAL

	manufacturing of such equipment(s), the bidder/ his sub-vendor(s) must create /have created manufacturing facilities at his works as per collaborator's/licenser's design, manufacturing and quality control system for such equipment(s). Further, in such a case, such qualified equipment manufacturers should have, directly or indirectly through its holding company/ subsidiary company, at least 26% equity participation in the Indian Joint Venture Company/ Subsidiary Company, which shall be maintained for a lock-in period of seven (7) years from the date of incorporation of such Joint Venture/ Subsidiary or upto the end of defect liability period of the contract, whichever is later
21.1.3	Before taking up the manufacturing of such equipment(s) as per clause 21.1.01, 21.1.2, the Bidder / its sub vendor(s) must create (or should have created) manufacturing and testing facilities at its works as per Collaborator / licensor's design, manufacturing and quality control system for such equipments duly certified by the Collaborator / licensor. Further, the Collaborator / Licensor shall provide (or should have provided) all design, design calculation, manufacturing drawings and must provide (or should have provided) technical and quality surveillance assistance and supervision during manufacturing, erection, testing, commissioning of equipments.
21.1.4	Bidder shall offer and supply only the type of the above equipment(s) for which it, itself or the manufacturer / Collaborator(s) / Licensor(s) proposed by the Bidder for the above equipment(s) is qualified.
21.1.5	The Employer reserves the right to fully satisfy himself regarding capability and capacity of Bidder / its sub-vendor(s) and the proposed arrangement and may prescribe additional requirement before allowing manufacture of the equipment listed above for this contract.
	Note to clause 21.1.1 : Whenever the term 'coal fired' is appearing above, "Coal" shall be deemed to also include bituminous coal/brown coal/Anthracite Coal/lignite.

**FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE
FOR
BHUSAWAL 1X660 MW**

Bidder's Name and Address:

To
MAHAGENCO,
BHUSAWAL
(1x660 MW)

Summary of Critical Equipment indicated under clause 21.1.00, sub-section-I, Part-A of Section-VI.

Equipment Name	Sub-Vendor Name	Collaborator's Name, if applicable	Seeking Qualification as per clause.....
-------------------	--------------------	--	---

Agitators

*21.1.1 /*21.1.2

Note : *Strike-off whichever is not applicable.

Agitators: We declare that, we(have manufactured and supplied at least one (1) number of Agitators with rating not less than that supplied for 500 MW or higher size unit for similar application (or) handling 650 m3 slurry for each agitator with slurry concentration $\geq 30\%$ and density $\geq 1220 \text{ kg/m}^3$ for similar application, Horizontal type working in Wet Limestone based FGD application in Coal fired power plant (or) Similar process/duty application in petrochemical or metals and mining industry and which has been in successful operation for minimum one(1) year reckoned as on 30th June 2019, as per the details furnished below:

Sl. No.	Description	Reference Work
1.	Name of the reference plant & location:	
2.	Client name and his address:	
3.	No. of units and capacity in MW of unit:	
4.	Whether power plant is coal fired	-*Yes/*No
5.	Whether operating in a Wet Limestone based FGD application in coal fired power plant	-*Yes/*No
6.	Name of equipment manufacturer & address:	
7.	Date of commission of the equipments:	
8.	Model no. of the equipment:	
9.	Brief Technical particulars of the equipments:	
10.	Agitators supplied for MW unit size	

Sl. No.	Description	Reference Work
11.	Whether the equipment(s) are in successful operation in atleast one(01) plant for a period not less than one(01) year reckoned as on 30 th June 2019	-*Yes/*No
12.	Flue gas Desulphurization system details/ Process Application details	*Technical extract/ *paper letter/ *email/ *Drawing from user or *contract document or *scheme or *any document in public domain enclosed at annexure... to Attachment-3K
13.	Details of the Tank: a) Tank capacity: b) No of Agitators installed in the Tank: c) Slurry volume handled by each agitator: d) Slurry Concentration: e) Slurry Density:	Client Approved Datasheet/Client Approved GA/ Contract Document duly signed by Client enclosed
14.	Scope of Work:	*Letter of Award or *Contract or *P.O. enclosed at Annexure. ... to Attachment-3K
15.	Performance details:	*Certificate/*Letter/*E-mail from End user enclosed at Annexure. to Attachment-3K

***Strike off whichever is not applicable.**

Technical Information of Agitators for Mahagenco Bhusawal (1 X 660 MW) FGD system					
	REF: BHUSAWAL:FGD:AGITATORS				
	PROJECT INFORMATION:				
a.	Owner		Mahagenco Bhusawal		
b.	Capacity (MW)		1X660 MW		
c.	Buyer		BHEL		
c.	Process/Application		Flue Gas Desulphurization		
PROJECT LOCATION					
a.	Country		India		
b.	State/Division		Maharashtra		
c.	District		Jalgaon		
Sl.No.	Description		Absorber Agitator		
1	Parameters				
a.	Type		Marine Propeller – Horizontal Type (Side Entry)		
b.	Medium to be handled		Gypsum and Limestone slurry		
c.	Seal Type		Mechanical Seal with Flushing		
d.	Emergency Flushing		Applicable		
e.	Duty		Continuous		
f.	Agitator location		Outdoor		
g.	Operation		Whenever Recirculation Pumps are not running and during FGD maintenance or shutdown condition.		
2	Tank Details				
a.	Tank shape		Rectangular		
b.	Tank Name		ABSORBER		
c.	Capacity of slurry (in m3)		1301 m ³		
d.	Dimension (m)		21.9 W x9.9 L x6H (H=liquid height)		
e.	MOC of Agitator				
i.	Impeller blade		Duplex 2507 or better material		
ii.	Impeller Hub		Duplex 2507 or better material		
iii.	Shaft		Duplex 2507 or better material		
iv.	Fasteners in wetted parts or In Tank fasteners		Duplex 2507 or better material		
v.	Fasteners in Non Wetted		GI fastener (40 μ plated) / SS		
vi.	Mounting base		Alloy 926/C276 (Wetted parts)		
vii.	Tank Nozzle (for inserting agitator) with Flange		Carbon Steel with 2mm C276 lining inside the pipe and on the flange face		
viii.	Flush pipe for Start up with flange		FRP or Duplex 2507 or Alloy 59 (Material has to be selected based of flushing velocity)		
ix.	Tank nozzle with flange (for Flush Pipe)		(i)For absorber agitator Carbon Steel with 2mm C276 lining inside the pipe and on the flange face		
x.	Agitator Support Leg		Carbon Steel		
f.	Minimum liquid level in the tank(m)		4.2		
g.	Normal liquid level in the tank		6.0		
h.	Maximum liquid level in the tank(m)		7		
i.	Quantity of Agitators per Tank		2 No's + 1 warehouse spare		
j.	Total Quantity		3 No's		
3	Slurry Analysis				
a.	Slurry to be handled		Gypsum and limestone slurry		
b.	Maximum solid particle size		200 mesh (75 μ)		
c.	Normal solid particle size, d50		325 mesh (43 μ)		
d.	Solid to be handled		Gypsum along with Limestone & other impurities		
e.	Chloride concentration		Max 20000 ppm		
f.	Hardness of particle		5-7 mohs scale		
g.	Slurry concentration, wt%		30%		
h.	Sp. Gravity of slurry		1.204		
i.	Sp. Gravity of Lime Stone & Gypsum		2.32(avg)		
j.	Viscosity of Slurry		10 cP		
k.	pH		4 to 8		
l.	SiO ₂ Content		4 to 6 g/l		
m.	Temperature		Normal -54.2 deg C; Design-70 deg C.		
4	Power loading for auxiliary power consumption		Not applicable		
00	17-09-2020	Fresh Release	(sd) MKT	(sd) PNR	(sd) RSB
REV	Date	Description	Prepared	Checked	Approved

Bharat Heavy Electricals Limited
Ranipet-632406, India.
Quality Recommendation (Mech)

To,

Shri. V Raghupathy, SM/Purchase
Kind Attn: Shri M Venkateswarlu, Mgr/Purchase

BAP: QA-Mech: FGD: AGT: 122
Dt. 07-11-2020

SI No.	AGITATORS For	Indent No	Indent Dt.	PGMA	Technical Specification
01	BHUSAVAL - MAHAGENCO (1X660 MW) Project	RFW01042-1043	20.10.2020	FW720	FGD: AGITATORS:Rev:00, DT:24.09.2020

“Customer/Mahagenco has informed that in case the item is covered under Sub-QR list, the proposed vendors for the same shall be accepted by QA after acceptance of vendor by Customer Engg group.”

1. Since Agitators appears under Sub-QR item, Sub-QR approved vendor by Engg. acceptable to Quality also.
2. Inspection and testing shall be done as per approved Quality plan, Quality plan to be approved by Customer/ Customer Consultant after review of BHEL.
3. Painting shall be as per Customer approved Painting schedule.
4. Arrange MQP from sub QR Cleared vendor for taking up with Customer for their review and approval. Find herewith-attached indicative MQP (QP NO.NORTH:704/00, DT: 26.10.2020). This MQP is indicative only and actual Quantum of Check/Stage may differ based on Project/Customer requirement and their approved MQP.
5. All the Agitators shall be inspected at supplier works as per approved QP/Approved Drawing/Approved datasheet and Technical Specification.
6. Packing of items shall be as per BHEL Engg Approved Packing Drawing/Packing Specifications.
7. BHEL Authorized representatives shall have the right to witness the necessary inspection and testing of goods mentioned in the PO. The supplier shall inform BHEL in advance about the readiness of the goods for inspection and testing. Inspection / Inspection wavier / approval by BHEL does not absolve Supplier's responsibility for conformity of the specification as per the terms of PO. Material Test Certificates shall be submitted to BHEL.
8. Annexure 'Q' and BOI's Details shall be part of enquiry File and shall be filled by Supplier with their duly sign and seal.
9. **Following Notes applicable for Inspection Purpose:**
 - a. Latest version of standards & Specification shall be applied.
 - b. Materials shall be procured in compliance to Functional Technical specification.
 - c. Gauges and measuring instruments with valid calibration only shall be used.
 - d. Inspection / Inspection wavier / approval by BHEL does not absolve Supplier's responsibility for conformity of the responsibility for conformity of the specification as per the terms of PO.
 - e. BHEL /BHEL Authorized representatives shall have the right to witness the necessary inspection and testing of goods mentioned in the PO.
 - f. In case of Vendor Drawing & Datasheet, it needs approval by BHEL Engineering.
 - g. QP shall be read along with relevant PO, BHEL Specification / Approved Drawing / Datasheet.

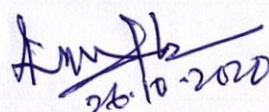
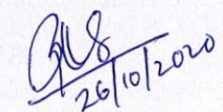
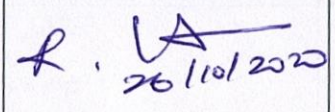


Rakesh Kr Madhu (Dy.Mgr/QA)
Prepared by

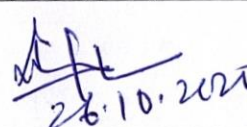
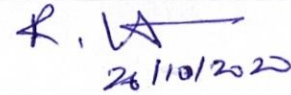


K Renjith (Mgr. /QA)
Reviewed & Approved by

		MANUFACTURING QUALITY PLAN						PROJECT: _____						
Main contractor		Manufacturer Name and Address:				ITEM: AGITATORS		PROJECT)						
						QP NO: NORTH:704, REV:00		PACKAGE:						
						DT: 26.10.2020		Page 1 of 4		CUST No: _____				
										MAIN CONTRACTOR: BHEL				
SL. NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUATUM 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 MATERIALS INSPECTION														
1.1	Shaft & Blades, rubber composition & other material including castings & forgings	Chem. & Mech Properties	Major	Review of MTC	One/Heat	One/Heat	Drawing/Data Sheet	TC	√	P	V	V	For shaft Dia ≥ 40mm UT shall be done as per ASTM A 388.	
		Dimensions		Measure nt	100%					IR	P	-		-
		Surface Defects		Visual	100%					IR	P	-		-
2.0	Motor	Separate MQP for Electrical Motor as applicable.												
3.0	Gear box	Make, Type, Rating, vibration, noise Review of Routine/Run test Report	Major	Review of manufacture's test report	100%	100%	Drawing/Data Sheet	TC/ Report	√	P	V	V		
4.0 IN PROCESS INSPECTION														
4.1	Welding Qualifications	WPS, PQR, WPQ	Major	WPS, PQR & WPQ	100%	100%	ASME Sec IX/AWS D1.1	WPS/ PQR	-	P	V	V		

MANUFACTURER SIGN & STAMP	LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (√) UNDER COLUMN 'D' SHALL BE SUBMITTED TO CUSTOMER AS A 'QA' DOCUMENTATION PACKAGE. M: MANUFACTURE/SUB SUPPLIER, C: MAIN CONTRACTOR(BHEL/BHEL AIA), N:NTPC P: PERFORM W: WITNESS AND V: VERIFICATION / REVIEW OF RECORDS, MTC: MATERIAL TEST CERTIFICATE, TC: TEST CERTIFICATE, MA: MAJOR, MI: MINOR, COC: CERTIFICATE OF CONFORMANCE, IR: INSPECTION REPORT, TR: TEST REPORT AIA: AUTHORISED INSPECTION AGENCY.	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA & QC-OLI)
				
		PREPARED BY	REVIEWED BY	APPROVED BY

		MANUFACTURING QUALITY PLAN						PROJECT: PROJECT) PACKAGE: CUST No: C MAIN CONTRACTOR: BHEL						
Main contractor		Manufacturer Name and Address:				ITEM: AGITATORS		DT: 26.10.2020		Page 2 of 4				
						QP NO: NORTH:704, REV:00								
SL. NO.	COMPONENT & OPERATION	CHARATERISTICS	CLASS	TYPE OF CHECK	QUATUM 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
4.2	Marking, cutting, Edge preparation Tacking	Dimensions	Major	Measure ment	100%	-	Appd. Drawing		IR		P	-	-	
4.3	Shaft & Impeller	Visual & Dimension check, face out and run out of shaft (after flange welding)	Major	Measure ment	100%	100%	As per Spec. & Appd. Drawing		IR	√	P	V	V	
4.4	Welds	Visual, Dimension	Major	Visual, Measure ment	100%	100%	ASME Sec-VIII/ AWS D1.1		IR	-	P	V	V	
4.5	Weld surface check	Weld soundness	Major	DPT	10%	10%	ASME Sec-VIII/AWS D1 Appendix 8		IR	√	P	W	V	
4.6	Impeller	Balancing	Major	Visual, Measure ment	100%	10%	ISO 1940-G40/Appd. Drg. & Data sheet		TR	√	P	W	V	

MANUFACTURER SIGN & STAMP	LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (√) UNDER COLUMN 'D' SHALL BE SUBMITTED TO CUSTOMER AS A 'QA' DOCUMENTATION PACKAGE. M: MANUFACTURE/SUB SUPPLIER, C: MAIN CONTRACTOR(BHEL/BHEL AIA), N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION / REVIEW OF RECORDS, MTC: MATERIAL TEST CERTIFICATE, TC: TEST CERTIFICATE, MA: MAJOR, MI: MINOR, COC: CERTIFICATE OF CONFORMANCE, IR: INSPECTION REPORT, TR: TEST REPORT AIA: AUTHORISED INSPECTION AGENCY.	Rakesh Kr Madhu (Dy. Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA & QC-OLI)
		 26.10.2020	 26/10/2020	 26/10/2020
		PREPARED BY	REVIEWED BY	APPROVED BY



MANUFACTURING QUALITY PLAN

Manufacturer Name and Address:

ITEM: AGITATORS

QP NO: NORTH:704, REV:00

DT: 26.10.2020

Page 3 of 4

MAIN CONTRACTOR: BHEL

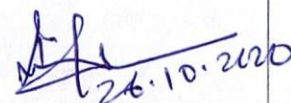
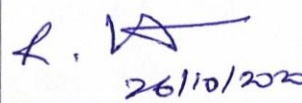
SL. NO.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N					M	C	N	
1	2	3	4	5	6		7	8	9	D*	10			11
4.7	Rubber Lining	Thickness of Rubber, Hardness, Spark test, Adhesion Test on Test piece	Major	Measurement	100%	10%	As per Specs./ Appd. Drg. & data sheet	Appd.Drg.& Data sheet,	TR	√	P	W	V	
5.0 FINAL INSPECTION														
5.1	Final Assembly Base Frame, Agitator etc.	Visual-Workmanship, Dimensional,	Major	Visual, Measurement	100%	10%	Appd.Drg. & Spec,		IR	√	P	W	V	
5.2	Free Air Run test of Complete assembly.	Current,RPM, Vibration,Noise & Temperature rise	Major	Measurement	100%	10%	Manufacturer's procedure/ Approved Drawing/Data Sheet		IR	√	P	W	W	*10% of each type (Vertical & horizontal)
5.3	Painting	Visual,DFT	Major	Paint Shade & DFT measurement	100%	10%	NTPC Approved Painting Schedule		IR	√	P	W	V	
5.4	Marking	Visual	Major	Visual	100%	10%	Appd.Drawing		IR	√	P	W	V	
5.5	Packing	Visual	Major	Visual	100%	100%	Appd.Drawing/Specification		COC	-	P	-	-	
5.6	Review of QA Documents	MQP Compliance	Major	Compliance Record	100%	100%	Completion of all documents, Test Report as per Approved MQP		IR	√	P	V	V	

MANUFACTURER SIGN & STAMP	LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (✓) UNDER COLUMN 'D' SHALL BE SUBMITTED TO CUSTOMER AS A 'QA' DOCUMENTATION PACKAGE. M: MANUFACTURE/SUB SUPPLIER, C: MAIN CONTRACTOR(BHEL/BHEL AIA), N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION / REVIEW OF RECORDS, MTC: MATERIAL TEST CERTIFICATE, TC: TEST CERTIFICATE, MA: MAJOR, MI: MINOR, COC: CERTIFICATE OF CONFORMANCE, IR: INSPECTION REPORT, TR: TEST REPORT AIA: AUTHORISED INSPECTION AGENCY.	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA & QC-OLI)
		PREPARED BY	REVIEWED BY	APPROVED BY

 Main contractor		MANUFACTURING QUALITY PLAN						PROJECT: PROJECT) PACKAGE CUST No: MAIN CONTRACTOR: BHEL						
		Manufacturer Name and Address:				ITEM: AGITATORS								
						QP NO: NORTH:704, REV:00								
						DT: 26.10.2020	Page 4 of 4							
SL. NO.	COMPONENT & OPERATION	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

Notes:

1. This QP is applicable for Mandatory spare also.
2. All other minor items, which are not cover under this QP, shall be manufactured inspected as per OEM (Original equipment Manufacturer)/BHEL standard practice and relevant standard. Relevant TC/COC will be submitted for the same.

MANUFACTURER SIGN & STAMP	LEGEND: * RECORDS, IDENTIFIED WITH "TICK" (✓) UNDER COLUMN 'D' SHALL BE SUBMITTED TO CUSTOMER AS A 'QA' DOCUMENTATION PACKAGE. M: MANUFACTURE/SUB SUPPLIER, C: MAIN CONTRACTOR(BHEL/BHEL AIA), N: NTPC P: PERFORM W: WITNESS AND V: VERIFICATION / REVIEW OF RECORDS, MTC: MATERIAL TEST CERTIFICATE, TC: TEST CERTIFICATE, MA: MAJOR, MI: MINOR, COC: CERTIFICATE OF CONFORMANCE, IR: INSPECTION REPORT, TR: TEST REPORT AIA: AUTHORISED INSPECTION AGENCY.	Rakesh Kr Madhu (Dy.Mgr/QA)	K Renjith (Manager/QA)	R Arunachalam (DGM/QA & QC-OLI)
		 26.10.2020	 26/10/2020	 26/10/2020
		PREPARED BY	REVIEWED BY	APPROVED BY

Details of BOI's/ Sub Systems with respect to Main Items

SI No.	Item/ Sub system Name	Quantity	Supplier Name	Place of Manufacturing
OEM (ORIGINAL EQUIPMENT MANUFACTURER) SEAL AND SIGN.				

Venkateswarlu M

From: RAMNANDHA M <ramnandha@bhel.in>
Sent: Monday, November 09, 2020 5:54 PM
To: Mandadi Venkateswarlu(Manager/MM-FGD/BAP); V Ragupathy(Sr Manager/PUR(FGD1& C)/BAP)
Cc: K C Gandhi Parimalam(Dy GM/QA-ELEC/BAP); N S Prabhakaran(Dy. Engineer/QC-SD & ADMN/BAP); K Renjith(Manager/QC- NDTL/BAP); Rakesh Kumar Madhu(Dy Manager/QA_MECH/BAP); Shanmuga Sundaram S(Dy Manager/9762_FGD/BAP); Jyotish Kumar Patel(Sr Engineer/9762_FGD/BAP); Pendurthi Sritharun(Dy. Engineer/9788_C& I/BAP)
Subject: CQR and Quality Requirements for LT Motors (Up to 160KW) for Agitators- MAHAGENCO Bhusawal (1 x 660 MW) FGD Project- Indents RFW01042, RFW01043
Attachments: RE: Supply of Agitators for Bhusawal FGD 1x660MW-Reg (2.11 MB); Supply of Agitators for Bhusawal FGD 1x660MW-Reg (1.78 MB); MAHAGENCO Bhusawal FGD Project _Agitators_LT MOTORS up to 160KW_Indegenious Vendor.pdf; MAHAGENCO Bhusawal FGD Project _Agitators_LT MOTORS up to 160KW_Foreign Vendor.pdf; MQP Format_MAHAGENCO Bhusawal FGD_LT Motors (upto 160 kW) used in Agitators.pdf; Indicative MQP for MAHAGENCO Bhusawal Agitators_LT Motor Up to 160KW- Inf purpose only.pdf

Dear Sr.,

Sub: Procurement of Absorber Agitators for MAHAGENCO Bhusawal FGD (1 X 660 MW) Project- BHEL WO No.: R4U8
Ref:- 1. Indent no: RFW01042, RFW01043 for MAHAGENCO Bhusawal FGD (1 X 660 MW) Project- BHEL WO No.: R4U8
2. Mail from MM dt 07.11.2020 (copy attached)
3. Mail from QA-Mechanical to MM dt 07.11.2020 (copy attached)

W.r.t above, following are the Quality Requirements for the supply of LT Motors being used in Absorber Agitators meant for MAHAGENCO Bhusawal (1 x 660 MW) FGD Project.

Specific confirmation / documents shall be obtained from all the OEM/LT Motors vendors.

I. W.r.t INDIGENOUS OEM VENDORS ONLY.

Sl no	Description & Quality Requirements	Specific confirmation by the vendor (Confirmed/ Not Confirmed)
01	OEM vendor shall meet all the requirements as in Annexure-I and also OEM Vendor shall endorse (Signature and Stamp in all the pages) in attached CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS(IE3) Up to 160KW used in Absorbers for FGD application (DOC NO.: BAP/QR/R4U8/Bhusawal/ LTM/ Agitators: 001 Rev No. 00 dt 09.11.2020) and send us the same to follow / ensure all the requirements in the event of an order.	
02	OEM vendor shall ensure Credentials of design and Manufacturing capabilities w.r.t. LT Motors by their LT Motor manufacture.	

03	No material shall be dispatched without BHEL/ Ultimate Customer – MAHAGENCO (Maharashtra State Power Generation Corporation Limited) inspection or its Appointed Inspection Agency M/s QUEST - CHP/MDCC clearances.	
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II.W.r.t FOREIGN (OUTSIDE INDIA) OEM VENDORS ONLY

Sl no	Description & Quality Requirements	Specific confirmation from Vendor (Confirmed)
01	OEM vendor shall meet all the requirements as in Annexure-II and also OEM Vendor shall endorse (Signature and Stamp in all the pages) in attached CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS(IE3) Up to 160KW used in Absorbers for FGD application (DOC NO.: BAP/QR/R4U8/Bhusawal/ LTM/ Agitators: 002 Rev No. 00 dt 09.11.2020) and send us the same to follow / ensure all the requirements in the event of an order.	
02	OEM vendor shall ensure Credentials of design and Manufacturing capabilities w.r.t. LT Motors by their LT Motor manufacture.	
03	No material shall be dispatched without BHEL/ Ultimate Customer – MAHAGENCO (Maharashtra State Power Generation Corporation Limited) inspection or its Appointed Inspection Agency M/s QUEST - CHP/MDCC clearances.	

Subject to the above specific confirmation from all the OEM vendors (ie for sl no: I & II) and also for Engg (both Electrical and Mechanical) requirements including Quality Requirements furnished by QA-Mechanical vide mail dt 07.11.2020 (copy attached), OEM Vendors offers will be acceptable w.r.t Quality Requirements.

Purchase shall ensure all the above Quality requirements while releasing the PO on successful bidder on specific confirmation from all the OEM vendors on the above .

Important Notes:

- We have noted that Mahagenco indicated that upto 160 Kw to be treated as LT Motor and more than 160 Kw to be treated as HT Motor.**
- Engg shall ensure customer approved LT Motor data sheet/drg/ spec (As applicable) to obtain CHP/MDCC from MAHAGENCO.
- MM shall ensure customer approval details if any with commercial for these LT Motors being a Non NTPC Project-MAHAGENCO Bhusawal (1 x 660 MW) and order shall be placed only on customer approved vendors (if applicable) to avoid any conflict during execution since MAHAGENCO will never yield for non-approved vendors and also LT Motors are to be inspected by both BHEL/ MAHAGENCO or its appointed inspection agency M/s QUEST.

CC: Shri Shanmuga Sundaram.S Dy. Manager(FGD)/ Shri Pendurthi Sri Tharun Dy. Engineer (EC&I).....Kindly refer our discussion on the above including type test requirements indicated in our Engg. Spec and with that of

MAHAGENCO spec and also LT Motor rating restricted to 160 Kw etc since these LT Motors are to be inspected by both BHEL/MAHAGENCO or its appointed inspection agency M/s QUEST.

Regards

Ramnandha M

ET-Quality Assurance-Electrical and C&I

BAP Ranipet, BHEL

Ph: 3126

BHEL BAP/ RANIPET / TAMIL NADU INDIA		OEM SUPPLIER To be filled by OEM Supplier		MANUFACTURING QUALITY PLAN FOR LT MOTOR (Up to TO 160KW) - FGD Application					MQP:E:LTM:BHUSAWAL :FGD AGITATORS :001			
		LT MOTOR Manufacture							REV:NO:00			
		To be filled by OEM Supplier							DATE: 07.11.2020			
		Page :										
S1.No.	COMPONENT/ASSEMBLY/OPERATION/TESTS	CHARACTERISTIC	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	D	AGENCY M BHEL/ BHEL AIA		REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	
INCOMING INSPCTIONS:												
1.1	Enamelled round copper conductor(Dual coated)MM	1.Overall diameter	Major	Mechanical	1 sample/lot	IS 13730 1993 Part 13 / IEC 60317-0-1-2008 (As applicable)	IEC 60317-0-1 2008	Plant format		P	V	EC gr purity: -99.6%
		2.Bare conductor diameter	Major	Mechanical	1 sample/lot	BHEL / MAHAGENCO Spec & Apprd Datasheet	BHEL / MAHAGENCO Spec & Apprd Datasheet	Plant format		P	V	
		3.BDV test	Major	Electrical	1 sample/lot	--do--	--do--	Plant format		P	V	
		4.Elongation	Major	Mechanical	1 sample/lot	--do--	--do--	Plant format		P	V	
		5.Continuity (insulation)	Major	Electrical	1 sample/lot	--do--	--do--	Insp report/ Supplier TC		P	V	
		6.Tan Delta (If applicable)	Major	Electrical	1 sample/lot	--do--	--do--	Insp report/ Supplier TC		P	V	
1.2	Aluminum Ingots	1.Chemical composition	Major	Chemical	1 sample/lot	--do--	--do--	Supplier Tc		P	V	
1.3	FAN	1.Diameter (ID&OD)	Major	Mechanical	1 sample/lot	--do--	--do--	Inspection Report		P	V	
1.4	Bearings (SKF OR FAG)	1.Type & Make	Major	Visual	100%	--do--	--do--	Inspection Record		P	V	
		2.Dimensions - ID,OD&width	Major	Mechanical	1 sample/lot	--do--	--do--	Inspection Record		P	V	
1.5	Terminal Block	1.Dimensions	Major	Mechanical	Plant std.	--do--	--do--	Inspection Report		P	V	
		2.Proof voltage test	Major	Electrical	Plant std.	--do--	--do--	Inspection Report		P	V	

BHEL BAP/ RANIPET / TAMIL NADU INDIA		OEM SUPPLIER To be filled by OEM Supplier		MANUFACTURING QUALITY PLAN FOR LT MOTOR (Up to TO 160KW) - FGD Application					MQP:E:LTM:BHUSAWAL :FGD AGITATORS :001			
		LT MOTOR Manufacture							REV:NO:00			
		To be filled by OEM Supplier							DATE: 07.11.2020			
		Page :										
S1.No.	COMPONET/A SSEMBLY/OPE RATION/TEST S	CHARACTE- RISTIC	CLASS	TYPE OF CHECK	QUANUTM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	D	AGENCY		REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	
INPROCESS INSPCETIONS:												
2.1	Stator core	1.Core length dia	Major	Mechanical	100%	--do--	--do--	Inspection Record	P	V		
		2.Core locking	Major	Visual	100%	--do--	--do--	Inspection Record	P	V		
		3.Rigidity of core	Major	Mechanical	100%	--do--	--do--	Inspection Record	P	V		
2.2	Die cast rotor	1.Core length	Major	Mechanical	100%	--do--	--do--	Inspection Record	P	V		
		2.Blow holes	Major	Mechanical	100%	--do--	--do--	Inspection Record	P	V		
2.3	Wound stator (if applicable)	1.Resistance	Major	Electrical	100%	--do--	--do--	Inspection Record	P	V		
		2.H.V.Test	Major	Electrical	100%	--do--	--do--	Inspection Record	P	V		
		3. Insulation resistance	Major	Electrical	100%	--do--	--do--	Inspection Record	P	V		
2.4	Final Assemby	1.Completeness	Major	Visual	100%	--do--	--do--	Inspection Record	P	V		
		2.Runout in case of flanged motors	Major	Mechanical	100%	--do--	--do--	Inspection Record	P	V		
		3.Mounting dimensions	Major	Mechanical	100%	--do--	--do--	Inspection Record	P	V		

BHEL BAP/ RANIPET / TAMIL NADU INDIA		OEM SUPPLIER To be filled by OEM Supplier		MANUFACTURING QUALITY PLAN FOR LT MOTOR (Up to TO 160KW) - FGD Application					MQP:E:LTM:BHUSAWAL :FGD AGITATORS :001			
		LT MOTOR Manufacture							REV:NO:00			
		To be filled by OEM Supplier							DATE: 07.11.2020			
		Page :										
S1.No.	COMPONET/A SSEMBLY/OPE RATION/TEST S	CHARACTE- RISTIC	CLASS	TYPE OF CHECK	QUANUTM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	D	AGENCY		REMARKS
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	
FINAL INSPCETION AND TESTING:												
3.1	Routine Test	1.Resistance Measurement on winding & space heater	Major	Electrical	100%	BHEL / MAHAGENCO Spec, GA Drawing & Apprd Datasheet and IS/IEC 60034 (As applicable)	BHEL / MAHAGENCO Spec, GA Drawing & Apprd Datasheet and IS/IEC 60034 (As applicable)	Inspection Record		P	W	
		2.HV Test	Major	Electrical	100%	--do--	--do--	Inspection Record		P	W	
		3.Phase sequence & direction of rotation	Major	Electrical	100%	--do--	--do--	Inspection Record		P	W	
		4.No load run test	Major	Electrical	100%	--do--	--do--	Inspection Record		P	W	
		5.Vibration test	Major	Mechanical	100%	--do--	--do--	Inspection Record		P	W	
		6.Noise level measurement	Major	Measurement	100%	--do--	--do--	Inspection Record		P	W	
		6.Name plate recheck	Major	Visual	100%	--do--	--do--	Inspection Record		P	W	
		7.Paint shade thickness & adhesion	Major	Visual & Measurement	100%	--do--	--do--	Inspection Record		P	W	
		8.Moutings & Overall dimensions	Major	Mechanical	100%	--do--	-do-	Inspection Record		P	W	

BHEL BAP/ RANIPET / TAMIL NADU INDIA		OEM SUPPLIER To be filled by OEM Supplier		MANUFACTURING QUALITY PLAN FOR LT MOTOR (Up to TO 160KW) - FGD Application					MQP:E:LTM:BHUSAWAL :FGD AGITATORS :001			
		LT MOTOR Manufacture							REV:NO:00			
		To be filled by OEM Supplier							DATE: 07.11.2020			
		Page :										
S1.No.	COMPONET/A SSEMBLY/OPE RATION/TEST S	CHARACTE- RISTIC	CLASS	TYPE OF CHECK	QUANUTM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE STANDARD	FORMAT OF REC	D	AGENCY		REMARKS
										M	BHEL/ BHEL AIA	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	
3.2 TYPE TESTS ###												
3.3	Preservation and Packing	1.Completeness	Major	Review	100%	--do--	--do--	Inspection Record		P	V	
		2.Motors covered with polythene sheets	Major	Visual	100%	--do--	--do--	Inspection Record		P	V	
		3.Packing	Major	Visual	100%	--do--	--do--	Inspection Record		P	V	
### TYPE TEST REQUIREMENTS FOR LT MOTOR INCLUDING DEGREE OF PROTECTION TEST REPORT (IP 55)												
BHEL/BHEL AIA (Authorised Inspection Agency) shall witness type tests and review the type test reports during including degree of Protection Test report (IP 55) for acceptance in line with BHEL/ Ultimate Customer - MAHAGENCO approved Data sheet/Drg/Spec for LT Motors. OEM / LT Motor Manufacture shall conduct all these type tests in presence of BHEL/BHEL AIA /Ultimate Customer MAHAGENCO without any cost implication to BHEL/Ultimate Customer - MAHAGENCO within reasonable time.												
1.Insulation Resistance Test 2. Measurement of Resistance of Stator 3. No Load test at Rated Voltage 4.Locked Rotor Readings of Voltage, Current and Power Input at a Suitable Reduced Voltage 5.Reduced Voltage Running up Test at no-load (for squirrel cage motor up to 37 kW only) 6.Open circuit voltage ratio of wound rotor motor (in case slip ring motors) 7.Locked Rotor Test (for Motors Having Output Rating Up to 37 kW) 8.Full load test to determine efficiency power factor and slip 9.Temperature Rise Test 10.Momentary Exceeds Torque Torque Test 11.High Voltage Test 12.Test for Vibration Severity 13.Test for Noise Level Measurement 14. Over Speed Test 15.Fault withstand test for Main Terminal Box 16. Degree of Protection TC (IP 55)												
LEGEND:												
OEM = Orgional Equipement Supplier M = LT Motor Manufacture - BHEL AIA = BHEL AUTHORISED INSPECTION AGENCY GA Drawing : General Arrangment Drawing MAHAGENCO - MAHARASHTRA STATE POWER GENERATION CORPORATION LIMITED (Ultimate Customer) OEM SUPPLIER : (To be Filled up by OEM Supplier) LT MOTOR Manufacture : (To be Filled up by OEM Supplier)												

Annexure-I**CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) Up to 160kW****(For INDIGENOUS OEM VENDOR ONLY)**

PROJECT: MAHAGENCO 1 x 660 MW (BHEL W.O no: R4U8) MAHAGENCO Bhusawal 1 x 660 MW (BHEL W.O no: R4U8) MAHAGENCO CONTRACT NO: DG/BSL U-6/2011/T-1/BTG+BoP EPC Contract/Amendment to LOA/No.1974 dtd 31.12.2018 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR (OEM) & ADDRESS: (To be filled by OEM VENDOR)		CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) -Up to 160kW used in <u>Agitators for FGD</u> <u>application</u> MAHAGENCO Bhusawal 1 x 660 MW (BHEL W.O no: R4U8)		DOC.NO: BAP/QR/R4U8 /Bhusawal/ LTM/ Agitators: 001 Rev NO.: 00 PAGE : Page 1 of 6 DATE: 07.11.2020	##Enquiry No: ## OEM Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:
Sl. NO.	DESCRIPTION	BHEL and Ultimate Customer - MAHAGENCO (Maharashtra State Power Generation Corporation Ltd),, Quality Requirements		##Specific confirmations by the vendor	
<u>ITEM: LT Motors (IE3) Up to 160KW</u>					
01	Type Test Requirements	A. Vendor shall conduct all the type tests for LT Motors as listed in SL NO: 01 (D) below and accordingly submit the type test reports. These reports should be for the test conducted on the identical/similar LT Motors to those proposed to be supplied under this enquiry and test (s) should have been witnessed by BHEL AIA (BHEL Appointed Inspection Agency) / BHEL /Ultimate client MAHAGENCO at respective LT Motor Manufacturer of OEM vendor.			
		B. Vendor shall conduct all the tests at no additional cost to BHEL either at third party lab (or) own lab in the presence of BHEL AIA (BHEL Appointed Inspection Agency) / BHEL /Ultimate client MAHAGENCO and submit the reports for review & approval.			
		C. Type Test reports review and approval by BHEL AIA (BHEL Appointed Inspection Agency) / BHEL / Ultimate client MAHAGENCO and its consultant DCPL is must in line with MAHAGENCO and its consultant DCPL approved data sheet / BOM/GA Drawing etc.			

Annexure-I**CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) Up to 160kW****(For INDIGENOUS OEM VENDOR ONLY)**

PROJECT: MAHAGENCO 1 x 660 MW (BHEL W.O no: R4U8) MAHAGENCO Bhusawal 1 x 660 MW (BHEL W.O no: R4U8) MAHAGENCO CONTRACT NO: DG/BSL U-6/2011/T-1/BTG+BoP EPC Contract/Amendment to LOA/No.1974 dtd 31.12.2018 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR (OEM) & ADDRESS: (To be filled by OEM VENDOR)	CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) -Up to 160kW used in <u>Agitators for FGD</u> <u>application</u> MAHAGENCO Bhusawal 1 x 660 MW (BHEL W.O no: R4U8)	DOC.NO: BAP/QR/R4U8 /Bhusawal/ LTM/ Agitators: 001 Rev NO.: 00 PAGE : Page 2 of 6 DATE: 07.11.2020	##Enquiry No: ## OEM Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:
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Sl. NO.	DESCRIPTION	BHEL and Ultimate Customer - MAHAGENCO (Maharashtra State Power Generation Corporation Ltd),, Quality Requirements	##Specific confirmations by the vendor
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ITEM: LT Motors (IE3) Up to 160KW

01	Type Test RequirementContd	D. The following Type test reports to be submitted covering the following for LT Motors as per relevant BIS (Bureau of Indian Standard) - BIS 325 /IS 12615/ IEC 60034 etc i. Insulation Resistance Test ii. Measuring of resistance of winding of stator and wound rotor (if applicable) iii. No load test at rated voltage to determine input current, power and speed. iv. Locked Rotor Readings of Voltage, Current and Power Input at a Suitable Reduced Voltage v. Reduced Voltage Running up Test at no-load (for squirrel cage motor up to 37 kW only) vi. Open circuit voltage ratio of wound rotor motor (in case slip ring motors) vii. Locked Rotor Test (for Motors Having Output Rating Up to 37 kW) viii. Full load test to determine efficiency power factor and slip ix. Temperature rise test. x. Momentary excess load test xi. High voltage test xii. Test for vibration severity of motor xiii. Test of 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 90dB(A).) xiv. Over speed test xv. Degree of Protection Tests (Minimum Ingress Protection - IP 55). Type test certificate shall be acceptable, if the test is conducted for IP-55 degree of protection on motors of similar frame size within last 10 years. xvi. Fault Withstand Test for main terminal box. Type test certificate shall be acceptable, if the test is conducted on exactly identical terminal box within last 3 years. xvii. Type test reports for motors located in fuel oil area having flame proof enclosures as per BIS 2148/ IEC 60079-1	
		E. The TCs / Type Test reports shall also be given as PDF file with index sheet & page control through Email & Soft Copy (File size to less than 9MB).	

Annexure-I**CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) Up to 160kW****(For INDIGENOUS OEM VENDOR ONLY)**

PROJECT: MAHAGENCO 1 x 660 MW (BHEL W.O no: R4U8) MAHAGENCO Bhusawal 1 x 660 MW (BHEL W.O no: R4U8) MAHAGENCO CONTRACT NO: DG/BSL U-6/2011/T-1/BTG+BoP EPC Contract/Amendment to LOA/No.1974 dtd 31.12.2018 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR (OEM) & ADDRESS: (To be filled by OEM VENDOR)	CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) -Up to 160kW used in <u>Agitators for FGD</u> <u>application</u> MAHAGENCO Bhusawal 1 x 660 MW (BHEL W.O no: R4U8)	DOC.NO: BAP/QR/R4U8 /Bhusawal/ LTM/ Agitators: 001 Rev NO.: 00 PAGE : Page 3 of 6 DATE: 07.11.2020	##Enquiry No: ## OEM Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:
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Sl. NO.	DESCRIPTION	BHEL and Ultimate Customer - MAHAGENCO (Maharashtra State Power Generation Corporation Ltd),, Quality Requirements	##Specific confirmations by the vendor
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ITEM: LT Motors (IE3) Up to 160KW

02	Quality Plan Requirement	1. MQP is applicable for these LT Motors and accordingly Actual LT Motor Manufacturer and OEM shall submit the MQP for BHEL and ultimate customer MAHAGENCO and its consultant DCPL approval. 2. If any of LT Motor manufacturer is having, ultimate customer MAHAGENCO and its consultant DCPL approved MQP (Manufacturing Quality Plan) / NTPC approved RQP (Reference Quality Plan) and having validity, the same is applicable for these LT Motor for inspection subject to obtaining ultimate customer MAHAGENCO and its consultant DCPL formal approval in the event of an order. 3. If LT Motor Manufacture / OEM vendor does not have MQP/RQP, they should submit a fresh MQP to BHEL/MAHAGENCO (in BHEL format) for review & approval. (copy attached).	
03	BHEL / ultimate Customer – MAHAGENO approved vendors	LT Motors are to be procured only from Ultimate Customer - MAHAGENCO approved vendors and no deviation on this specific customer requirement is acceptable.	
04	Inspection Methodology to be adopted at Actual LT Motor Manufacture works by OEM vendor	<u>LT Motors (below 60 KW) – Inspection Categorization: II</u> All Routine Tests (including Test for noise level and Test for vibration as Routine Tests) and Type tests on LT Motors are to be ensured by OEM vendor & witnessed by BHEL/BHEL AIA (BHEL authorized inspection Agency) at LT Motor manufacturer works including review of Type Test Reports and Degree of Protection Test Reports (IP 55) as per approved MQP & approved data sheet/drg/spec / as per relevant BIS (Bureau of Indian Standard) - BIS 325 / IS 12615/IEC 60034 etc and all the Routine Test and Type Test Reports with Inspection report (IR) to be submitted for BHEL/Ultimate Customer – MAHAGENCO and its consultant DCPL for review and to obtain inspection and dispatch clearance .	

Annexure-I**CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) Up to 160kW****(For INDIGENOUS OEM VENDOR ONLY)**

PROJECT: MAHAGENCO 1 x 660 MW (BHEL W.O no: R4U8) MAHAGENCO Bhusawal 1 x 660 MW (BHEL W.O no: R4U8) MAHAGENCO CONTRACT NO: DG/BSL U-6/2011/T-1/BTG+BoP EPC Contract/Amendment to LOA/No.1974 dtd 31.12.2018 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR (OEM) & ADDRESS: (To be filled by OEM VENDOR)	CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) -Up to 160kW used in <u>Agitators for FGD</u> <u>application</u> MAHAGENCO Bhusawal 1 x 660 MW (BHEL W.O no: R4U8)	DOC.NO: BAP/QR/R4U8 /Bhusawal/ LTM/ Agitators: 001 Rev NO.: 00 PAGE : Page 4 of 6 DATE: 07.11.2020	##Enquiry No: ## OEM Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:
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Sl. NO.	DESCRIPTION	BHEL and Ultimate Customer - MAHAGENCO (Maharashtra State Power Generation Corporation Ltd), Quality Requirements	##Specific confirmations by the vendor
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ITEM: LT Motors (IE3) Up to 160KW

04	Inspection Methodology to be adopted at Actual LT Motor Manufacture works by OEM vendor...Contd	<u>From 60KW and up to 160KW – Inspection Categorization: I</u> All Routine(including Test for noise level and Test for vibration as Routine Tests) & Type Tests on LT Motors are to be ensured by OEM Vendor and same shall be offered to BHEL/ BHEL AIA (BHEL authorized inspection Agency) / Ultimate Customer-MAHAGENCO for inspection & witnessing including review of Degree of Protection Test Reports as per approved MQP /RQP / approved data sheet / drg / spec / as per relevant BIS (Bureau of Indian Standard) - BIS 325 /IS 12615/ IEC 60034 etc and all the Routine Test Reports , Type test Reports including Degree of protection test report with Inspection report (IR) to be submitted for BHEL/Ultimate Customer – MAHAGENCO and its consultant DCPL for review and to obtain inspection and dispatch clearance.	
		BHEL/ BHEL AIA (BHEL authorized inspection Agency) / Ultimate Customer-MAHAGENCO to witness / perform inspection at LT Motor Supplier works and submit all the inspection documents and routine & Type test reports including Degree of Protection Test Reports (IP 55) as per approved MQP & approved data sheet / drg / spec / as per relevant BIS (Bureau of Indian Standard) - BIS 325 /IS 12615/ IEC 60034 etc.	
		No material shall be dispatched without BHEL / BHEL AIA and Ultimate Customer – MAHAGENCO Inspection and dispatch clearance.	
05	Painting Requirements	Painting requirement like paint shade and painting thickness including no of coats if any are to be ensured by the OEM vendor for these LT Motors as per BHEL/ Ultimate Customer -MAHAGENCO and its consultant DCPL approved data sheet/drg/spec (As applicable).	
06	Packing	Packing shall be as per Specification / Drg. / Data sheet including sea worthy packing if any to avoid any transit & handling damages.	
07	For Inspection call	Inspection call by OEM Vendor for LT Motor inspection at Actual LT Motor Manufacture works to be raised for BHEL/BHEL AIA inspection / Ultimate Customer – MAHAGENCO including for type test witnessing to be ensured / addressed to Mr R Kesavan., DGM (QC-Proc), Mobile no: +91 9443006303., Email id: kesavan@bhel.in and Mr Zeeshan Ali., Sr.Engineer (QC-Proc), Mobile no: +91 9443149691., Email id: kovak@bhel.in including for inspection related activities for immediate response / resolution.	

Annexure-I**CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) Up to 160kW****(For INDIGENOUS OEM VENDOR ONLY)**

PROJECT: MAHAGENCO 1 x 660 MW (BHEL W.O no: R4U8) MAHAGENCO Bhusawal 1 x 660 MW (BHEL W.O no: R4U8) MAHAGENCO CONTRACT NO: DG/BSL U-6/2011/T-1/BTG+BoP EPC Contract/Amendment to LOA/No.1974 dtd 31.12.2018 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR (OEM) & ADDRESS: (To be filled by OEM VENDOR)	CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) -Up to 160kW used in <u>Agitators for FGD</u> <u>application</u> MAHAGENCO Bhusawal 1 x 660 MW (BHEL W.O no: R4U8)	DOC.NO: BAP/QR/R4U8 /Bhusawal/ LTM/ Agitators: 001 Rev NO.: 00 PAGE : Page 5 of 6 DATE: 07.11.2020	##Enquiry No: ## OEM Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:
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Sl. NO.	DESCRIPTION	BHEL and Ultimate Customer - MAHAGENCO (Maharashtra State Power Generation Corporation Ltd),, Quality Requirements	##Specific confirmations by the vendor
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ITEM: LT Motors (IE3) Up to 160KW

08	Document Package / Dossier	Specific confirmation for Document Package in the event of an order (3 hard copies + soft copies in PDF file) is to be given containing the following with proper linkages (.) (i) Index Sheet (ii) MQP/RQP (iii) TCs identified by BHEL/MAHAGENCO for record for “CHP” (Customer Hold Point) Verification & Witness “W” portion as given in MQP / RQP / MQP (as applicable). (iv) Final Inspection Report + TC (v) BHEL AIA (BHEL Appointed Inspection Agency) / BHEL report + TC (vi) Ultimate customer MAHAGENCO (Maharashtra State Power Generation Corporation Ltd) CHP (Customer Hold Point) / MDCC (Material Dispatch Clearance Certificate) (vii) Type test reports conducted/submitted with approval with approved data sheet and BOM with actual make used with Customer approved drgs.	
09	Important notes	<u>Inspection Categorization: I</u> Inspection by BHEL/BHEL AIA and also by Ultimate Customer – MAHAGENCO based on MQP/RQP approved and as in sl no:04 <u>Inspection Categorization: II</u> Inspection by Main contractor (BHEL) / BHEL AIA based on Ultimate Customer – MAHAGENCO approved MQP/RQP & based on inspection as in sl no:04	
		Any cost implication for conducting checks / tests including for witnessing of any of the tests at Actual LT Motor Manufacture Works by BHEL / BHEL AIA / Ultimate Customer – MAHAGENCO is in the scope of OEM Supplier only and no extra cost if any will be admissible in the event of an order and also during execution of the contract.	

Annexure-I

CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) Up to 160kW

(For INDIGENOUS OEM VENDOR ONLY)

PROJECT: MAHAGENCO 1 x 660 MW (BHEL W.O no: R4U8) MAHAGENCO Bhusawal 1 x 660 MW (BHEL W.O no: R4U8) MAHAGENCO CONTRACT NO: DG/BSL U-6/2011/T-1/BTG+BoP EPC Contract/Amendment to LOA/No.1974 dtd 31.12.2018 PACKAGE: FGD PACKAGE MAIN CONTRACTOR: BHEL - RANIPET SUB CONTRACTOR (OEM) & ADDRESS: (To be filled by OEM VENDOR)		CONTRACT QUALITY REQUIREMENTS (CQR) for LT MOTORS (IE3) -Up to 160kW used in <u>Agitators for FGD application</u> MAHAGENCO Bhusawal 1 x 660 MW (BHEL W.O no: R4U8)		DOC.NO: BAP/QR/R4U8 /Bhusawal/ LTM/ Agitators: 001 Rev NO.: 00 PAGE : Page 6 of 6 DATE: 07.11.2020		##Enquiry No: ## OEM Supplier Name & Address: ##Offer reference: ##Date: Contact Official Name: Mobile no: Email id:	
Sl. NO.	DESCRIPTION	BHEL and Ultimate Customer - MAHAGENCO (Maharashtra State Power Generation Corporation Ltd),, Quality Requirements				##Specific confirmations by the vendor	

ITEM: LT Motors (IE3) Up to 160KW

10	Motor details Vendor shall furnish following Motor details for the Agitators applicable for this enquiry. MAHAGENCO Bhusawal 1 x 660 MW – FGD Project :-				
	S. No	Agitators	LT Motor		
			Rating (in kW)	Quantity (in nos)	Make
	1	Absorber tank Agitator			
	2	Other LT motors involved in the system (if any)			

OEM Supplier signature with seal

Necessarily to be filled up & submitted by the OEM vendor at the time of offer itself otherwise the offer may not be considered w.r.t Quality Requirements against LT Motors being BHEL/ ultimate customer – MAHAGENCO (Maharashtra State Power Generation Corporation Limited) specific requirements.

Sl. No	Annexure-C for Commercial Terms and Conditions	SUPPLIER COMMENTS: REQUESTED TO OFFER EITHER CONFIRMED OR ACCEPTED OR REMARKS IF ANY DEVIATION IS TAKEN
1	Terms of Delivery and Location : FOR Destination: Destination for main supply is STORES/BHEL SITE OFFICE, Bhusawal 1X660MW site for Enq SI no.01 - 02 as indicated in the enquiry header (Cost, Packing, Forwarding ,Freight & Insurance etc., are in Supplier's scope i.e. included in the quoted prices.), non acceptance of terms of delivery is liable to rejection. Evaluation will be done on grand total Package basis and Total cost to BHEL.	
2	Drawings, Data sheets, vendor list etc are to be submitted along with tender documents and soft copy to be uploaded. Specific confirmation to be given.	
3	Packing drawing should be submitted along with technical documents. This will also to be evaluated and approved.	
4	Quoted currency should be in Indian Rupee(INR) only.	
5	Delivery Period: Delivery Period: To mention clearly the exact delivery period from date of drawing,data sheet, MQP approval and manufacturing clearance as it attracts contractual penalty on delays.Delivery is the essence of the contract.	
6	Terms of payment: 1. Main supply: 90 % payment will be made directly thru' EFT within 45 days for MSE Vendors and 90 days for Non-MSE vendors from the date of receipt and acceptance of materials at BHEL Site with submission of PBG. If the site is not ready for 2 years from the date of supply, then this balance 10% payment for the supply portion may be released within 45 days with the equivalent value of BG, valid for 2 years or till completion of E&C, whichever occurs earlier. 2. Supervision of E&C: 100% Supervision charges for erection and commissioning (E&C) will be paid within 45 days for MSE /90days for non-MSE on successful completion of E&C against submission of invoice with E&C completion certificate issued by BHEL site officials. 3. Mandatory Spares: 100% within 45 days for MSE vendor and 90 days for Non MSE vendor against receipt and acceptance of material at Stores/BHEL/Ranipet-6. (4). No advance payment is applicable. (5). No LC payment term is applicable. (6).No other payment terms except 1, 2 & 3 of above is acceptable.If any bidder quotes for advance payment or LC payment or any other payment term other than above mentioned payment terms under 1, 2 & 3 shall be liable for rejection of their bid on commercial terms.	
7	Contract Execution Bank Guarantee (CEBG): The Supplier shall submit a BG for 2% of the contract value valid for the agreed delivery period + 12 Months. Attached CEBG Format is to be signed and submitted along with Annexure-C as a token of acceptance. Please note that no deviation is allowed. If not accepted, offer is liable to rejection. Suppliers who are already registered with BHEL and having a vendor performance rating of A or A+ grade would be exempted from submission of CEBG	
8	PERFORMANCE BANK GUARANTEE (PBG): 10% OF ORDER VALUE is required as PBG for a period of 27 months from the date of SRV/Site Acknowledgement (including 12 months retention period).	
9	OFFER Validity: Minimum 120 days shall be offered from the date of Techno Commercial Bid opening (Part-I). The specific acceptance for this offer validity is must. Not providing bid validity minimum 120 days is liable to rejection.	
10	Clientele List: Supplier to submit detailed clientele list with their full address including detail of contact person with phone no., fax no. & e-mail ID as per respective clause of Annexure - B (General terms and Conditions).	
11	Price bid opening through Sealed Bid: The price bid finalisation shall be done through sealed bid and for more details please refer Annexure-B (General terms and Conditions).	
12	Test Certificate: To be submitted with Chemical and Mechanical properties and dimensions as per the Standards and Technical Delivery Conditions as mentioned in Technical Specification. The Test Certificate shall be as per Annexure Q.	

13	QP: Specific conformation to Submission of manufacturer/vendor quality plan for our review and approval and shall be as per annexure Q.	
14	Guarantee Certificate : Please conform furnishing guarantee certificate in BHEL format for 18 months from the date of commissioning or 24 months from the date of last despatch whichever is earlier.	
15	Warranty shall be as per technical specification	
16	Inspection before despatch: Inspection before despatch at supplier's works by BHEL / BHEL appointed Inspection agency / Customer / Customer appointed inspection agency. Other details shall be as per Annexure Q.	
17	Liquidated Damages (LD) : The applicable LD shall be at the rate of 0.5% per week to maximum of 10% of PO value for the deliveries made beyond the agreed Delivery Period. Delivery being the essence of BHEL's contract requirements, in the event that a Supplier does not accept the above LD condition, the offer would be loaded to the extent of the shortfall with respect to upper limit specified above. Date of material receipt at our stores (Day Book date) will be considered as the 'Delivery date as mentioned in purchase order.	
18	Risk Purchase Clause: As per clause-I of Annexure-B page no 17, Supplier Confirmation is Required. Non acceptance to risk purchase clause may leads to rejection of offer. Hence bidders are requested to accept risk purchase clause and no clarification on this will be entertained.	
19	GST in % (FOR INDIGENOUS SUPPLIER): To be indicated by the supplier. GST invoice is required for availing Input Tax Credit and conformation to pass on ITC.	
20	GSTIN of the supplier/Works.	
21	HSN Code(S) of the items offered.	
22	Firm Price: Prices shall be kept firm till completion of supplies and acceptance of materials at BHEL Project Sites.	
23	Supplier Registration Form- Online submission is to be done and soft copy of the same to be uploaded along with Technical Bid by new vendors.	
24	MSE / Non MSE Status with support documents.	
25	Approximate weight and cubage of the consignment.	
26	Contact details of bidders: Contact persons Name/Designation/Mobile No/Email ID/Fax No/Phone No etc. should be furnished.	
27	Pointwise conformation/acceptance or comments to our technical specification is must and Each page shall be signed BY THE BIDDER and affixed the official seal.	
28	Deduction of Income Tax: (i) TDS shall be deducted, as applicable, for the supervision of Erection & Commissioning Charges. (ii) TDS return shall be filed and TDS certificates shall be issued by BHEL .	
29	For this public procurement (preference to make in India), order 2017 dt 15.06.2017, 28.05.2018 & 04.06.2020 and subsequent order 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.	
30	Class I local supplier: Minimum Local content shall be 50%. Class II local supplier: Minimum Local content shall be between 20% to 50%. Non-Local supplier: Minimum Local content shall be below 20% Please furnish details of location where this value addition has been done (.....).	
31	Margin of purchase preference to make in India shall be 20%.	
32	False declaration will be in breach of the code of integrity under Rule 175 (i)(h) of the General Finance Rule for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Finance Rules along with such other actions as may be permissible under Law.	
33	Vendor shall duly filled and submit the MII local content delcaration form as given in the tender.	
34	Vendor shall duly filled and submit the eligibility criteria form as given in the tender.	

Sl.No	Annexure-Q	##Specific confirmations by the manufacture
1	Quality Plan Requirement:	
1a.	(i) MQP (Manufcutering Quality Plan) shall be submitted in attached format for BHEL/Customer review & approval. Typical MQP is attached for indicative purposes for guidance & use.	
1b.	(ii) MQP shall invariably cover w.r.t Inward inspection including on Raw materail Procurement, In process and Final inspection in elaborated way/details.	
1c.	(iii) Bidder shall also to give specific confirmation that on need basis, their competent officials shall visit to BHEL/customer for finalization of Quality plan including test procedure/methodology during preaward / post award approval / detailed engineering in the event of an order.	
1d.	(iv) No deviation on BHEL/Customer approved MQP is acceptable.	
1e.	(v) Bidder shall agree to submit all cross referred documents other than codes/standrads to BHEL/Customer/Consultant.	
2	Important Notes shall be included in MQP : (a) Latest revision of Standard s & Specification shall apply. Only International Standards are applicable. (b) Materials shall be procured in compliance to Functional Technical Specification. (c) Inspection shall be in compliance with Approved Quality Control Procedure for the Product. (d) NDT shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME Section V. (e) Gauges and measuring Instruments, with valid calibration only shall be used. (f) Cleaning and Painting of products shall be carried out as per Approved Painting Schedule. (g) Finished Products shall be packed to comply with Approved Packing Schedule. (h) Welding shall be carried out by Qualified Personnel with compliance to Approved NDT Procedures and Acceptance Norms, as per ASME Section V.	
3	Inspection will be carried out by BHEL/BHEL apointed Third Party Inspection Agency (TPIA) / Customer/Customer Apointed Inspection Agency/Consulatnat. This is applicable for all Stage inspection and Final Inspection identified as "W" - Witness or "CHP" - Customer Hold Point as per customer approved Quality Plan/ Technical specification / Approved Drawing/ Approved Data sheet / Scheme / PID / PFD / SLD (Process Instrumentaion Diagram / Process Flow Diagram / Single Line Diagram) etc (As applicable).	
4	Inspection Agency (1) Any one of the following Third Party Inspection Agency (TPIA) shall be appointed by the bidder and same shall be furnished by the bidder in techno commercial bid itself. (2) The details of TPIA with contact details like Name of the official, Phone no, Email id shall also to be submitted during pre/post award. List of TPIA 1.M/s Bureau Veritas 2.M/s TUV-Nord 3.M/s TUV-SUD 4.M/s TUV Rheinland 5.M/s Lloyds Register 6.M/s SGS 7.M/s Germanischer Lloyds 8.M/s QUEST 9.M/s Certification Engineers International 10.M/s Intertek 11.M/s IR Class Systems and Solutions 12.M/s DNV 13. M/s Fichtner 14. M/s ABS Inspection Services	

Sl.No	Annexure-Q	##Specific confirmations by the manufacture
5	Stage Inspection during manufacturing Process : Stage Inspection during manufacturing shall be carried out as per approved quality plan and all necessary documents shall be provided for review, verification and clearance for further processing. This inspection call shall be given well in advance (atleast 2 weeks before) to TPI/Bidder's own inspection agency to avoid delay in the manufacturing processes.	
6	Inspection before despatch : Inspection before despatch at supplier's works shall be carried out by BHEL/BHEL appointed Inspection agency. Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet .	
7	Painting shall be done strictly as per BHEL/Customer approved painting schedule / scheme only. Paint Thickness / Paint shade shall be ensured as per BHEL / Customer approved painting schedule / specification / data sheet etc. No deviation is acceptable unless otherwise accepted by BHEL/Customer in writing. Any conflict if any among BHEL / Customer approved painting schedule / Spec / data sheet etc shall be brought to the notice to BHEL well in advance before proceeding including the BOI being procured for assy / skid like motors etc	
8	Specific conformation for document package in the event of an order (2 Hard copies & soft copy in PDF file) is to be given containing the following with proper linkages (i) Index Sheet (ii) MQP/RQP/Endorsement Sheet (As applicable) (iii) TCs identified by BHEL/ Customer for record for "CHP" / "W" and Verification portion ("V") as given in approved QP. (iv) Final inspection report + TC including Chemical + Mechanical + HT + NDT etc (v) Third party Inspection report + TC (vi) Customer CHP/ MDCC (vii) Type test / Performance Test reports conducted (viii) Type test / Performance Test approval/ clearance obtained from BHEL/Customer (ix) BOM with As Build Drgs with actual make / rating used with BHEL/customer approved drawings.	
9	Packing shall be as per BHEL Packing schedule / approved drg. This shall be ensured to take care transit / handling / transshipment in Road / Sea / Air. Photographs are to be submitted for BHEL review before despatching the material as per contract conditions.	
10	Outsourcing of test facilities: Bidder shall ensure all the testing facilities in house. However If any of the test facilities are not available with successful bidder, then bidder shall ensure the same at NABL accredited third party lab / Govt / Govt Lab for major testing such as NDT, Electrical & Mechanical testing.	
11	Important Note: No deviation on the above requirement 01 to 10 is acceptable w.r.t Quality Requirement and those offers not meeting these specific customer requirement is liable for rejection and hence the bidder shall submit all the required documentary evidences in the offer itself.	
12	## Necessarily to be filled up by the bidder at the time of offer itself otherwise the offer may not be considered w.r.t Quality Requirement being customer specific requirement.	



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, 29.05.2019 & 04.06.2020 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 links <https://dipp.gov.in/public-procurements>

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

https://dipp.gov.in/sites/default/files/PPP-MII%20Order%20dt%2029th%20May%2019_0.pdf

<https://dipp.gov.in/sites/default/files/PPP%20MII%20Order%20dated%204th%20June%202020.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. Vendors to get themselves registered in Udyam registration Portal. The existing Micro & Small vendors are to submit copy of CA certificate along with Udyog Adhar Registration Certificate.

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: bhpwar@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) Transhipment 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. Decision to go for RA would be taken before floating of the tender. In case it is decided to go for RA, same shall be declared upfront in NIT by inserting the following clause:
“BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com) for this tender. RA shall be conducted among all the techno-commercially qualified bidders. Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.”
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 and shall be informed in the NIT conditions .

1. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.
2. 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.
3. 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.
4. 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.

5. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.
 6. 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.
 7. 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).”
 8. 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.]
 9. This calculation sheet will be finalized based on the evaluation criteria specified in the NIT.
 10. 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 electronic price bid) 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.)
 12. Generally the start price for the RA would be the lowest of
 - a) Lowest envelope (sealed electronic price bid) 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. The start price & bid decrement will be decided by RA committee of BHEL and the same would be communicated to the service provider, to start the bidding process.
 22. Only those bidders who have submitted the ‘Process compliance form’ duly signed and within the scheduled time would be eligible to participate further in RA process.

23. RA will be conducted if three or more bidders are techno- commercially qualified . In case of more than four techno commercially qualified bidders , H1 bidder (whose quote is highest in sealed envelope (eps) price bids) will not be allowed to participate in further RA process. However there will be no H1 removal in case , H1 bidder happens to be MSE or qualifying under PPP-MII , order 2017 irrespective of the number of bidder qualifying techno commercially.
24. In case multiple H1 bidders, all H1 bidders (excluding MSEs and bidders qualifying under PPP- M11 Order 2017) shall be removed provided three bidders remain in fray, else no H1 removal.
25. If the lowest sealed envelope (eps) price bids is the starting price, then the lowest bidder in sealed envelope (eps) price bids 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.
26. If the start price is lower than the lowest sealed envelope (eps) price bids , on acceptance of such start price by any bidder, this bid would be indicated as current L1 for further bidding.
27. In case of no further bidding, RA will be deemed to have been successful with current L1 bidder.
28. All bidders who had given their bids would be able to see their rank and L1 price and their ranking L1, L2 etc. on the screen. Once the RA is done, the ranking status would be based on the last quoted price irrespective of quote received in RA or sealed envelope (eps) price bid.
29. 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 three.
- 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) or b) satisfies.
29. In cases of failure of RA, retendering shall be resorted to without conducting RA in the subsequent tender
30. Whenever the evaluation is done on total cost basis, after RA, prices of individual line items shall be reduced on pro-rata basis.
31. In case of splitting requirement, H1 bidder(s) who were removed from participation in RA may also be considered for counter offer if the pre-stated (NIT) number of suppliers do not accept the counter offer. However the principle of splitting to N-1 bidder shall be maintained in line with extant Purchase Policy / Work Policy
32. 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.
33. 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.No	IEM	Email
1.	Shri Arun Chandra Verma, IPS (Retd.)	acverma1@gmail.com
2.	Shri Virendra Bahadur Singh, IPS (Retd.)	vbsinghips@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.

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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.
19	24.09.2019	Clause C,(n) - Preference to Make in India – modified. Clause L,(e) - New IEMs Updated
20	11.03.2020	Clause L,(e) – IEM’s address removed



21	11.06.2020	Clause G – Reverse Auction modified
22	22.07.2020	Clause C,(n) - Preference to Make in India – modified. Clause k (2) - MSE registration modified

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 autoextension 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 prespecified 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).



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- 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:

***(To be submitted In the company letter head by supplier)**

From.

M/s _____

Address: _____

I/we are bidder from _____ (country). We does not belong to any of the below category mentioned.

1. Any of entity/office/workshop of your organisation/incorporation, established in a country sharing land border with India, If yes, provide the full address of all such locations.
2. Any of subsidiary of your organisation/incorporation, established in a country sharing land border with India, If yes, provide the full address of all such locations.
3. Any of entity/office/workshop of your organisation/incorporation, controlled in a country sharing land border with India, If yes, provide the full address of all such locations.
4. Any of entity whose beneficial owner is situated in a country sharing land border with India, If yes, provide the full name, address of all such locations.
5. Any Indian Agent available, If so, Provide details of address and contacts.
6. Any employee/directors who is/are citizen of country sharing land border with India, If yes, provide the full name, employee code and address of all such locations.
7. Any of consortium/joint venture of your organisation/incorporation, established in a country sharing land border with India, If yes, provide the full address of all such locations.

Meaning of beneficial owner

- 1) In case of a company or limited liability partnership, beneficial owner is the natural person, who, whether acting alone or together, or through one or more judicial person, has a controlling ownership interest or who exercises control through other means.

Explanation

- a) Controlling ownership interest means ownership of or entitlement to more than twenty-five percent of shares or capital or profits of the company.
- b) "control" shall include the right to appoint majority of the directors or to control the management rights or shareholder's agreement or voting agreement.

***(To be submitted In the company letter head by supplier)**

- 2) In case or a partnership firm the beneficial owner is the natural person (s) who whether acting alone or together or through one or more judicial person, has ownership of the entitlement to more than fifteen percent of capital or profits of the partnership.
- 3) In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together or through one or more judicial person, has ownership of the entitlement to more than fifteen percent of the property or capital or [profits of such association or body of individual.
- 4) Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official.
- 5) In case of a trust, the identification of beneficial owner (s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust and any other natural person exercising the ultimate effective control over the trust through a chain of control of ownership.
- 6) An agent is a person employed to do any act for another, or to represent another in dealing with third person.

We have read the clause regarding restriction on procurement from a bidder of a country which shares a land border with India, we hereby declare that we do not belongs to any such country and are eligible to be considered.

In case, any of information is found to be false, even after bid acceptance, immediate termination may happen and action will be taken as per law.

Format is being filled without altering any of the clause mentioned in the given format**

Dated: _____

Authorised Sign and stamp_____

***(To be submitted In the company letter head by supplier)**

Subject: Public Procurement (Preference to Make In india)

References:

- 1.P-45021/2/2017-B.E-II dated. 15th June-2017,
- 2.P-45021/2/2017-PP(BE-II) dated. 28th May-2018 ,
- 3.P-45021/2/2017-PP(BE-II) dated. 29th May-2019.
- 4.P-45021/2/2017-PP(BE-II) dated.4th June-2020

We hereby declare with reference to above subject and references that
M/s ----- (Tick whichever is applicable as below)

"Class-I local supplier" meeting the requirement of minimum local content equal to 50%(fifty percent) or more defined in the above government notification for the goods and services (or)

"Class-II local Supplier" meeting the requirement of local content 20% to less than 50%(fifty percent) defined in the above government notification for the goods and services

Please mention the details against the following:

Enquiry no:----- dated. -----

Type of Supplier (Class-I/Class-II)

Product:-----

Project:.....

Details of location at which local value addition will be made is as follows:

We also understand that the false declarations will be in breach of the code of Integrity under rule 175(1)(i)(h) of the General financial rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law.

Authorized Signature M/s-----
(Signature and seal)

Place:.....

Date:.....

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

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.