BHEL Tenders

Government eProcurement System

Tender Details

Date : 12-May-2022 12:04 PM

Print

Basic Details

Organisation Chain	Bharat Heavy Electricals Limited||BAP - Ranipet||Purchase		
Tender Reference Number	7720171E		
Tender ID	2022_BHEL_12253_1		
Tender Type	Open Tender	**Form of contract**	Supply
Tender Category	Goods	**No. of Covers**	2
General Technical Evaluation Allowed	No	**ItemWise Technical Evaluation Allowed**	No
Payment Mode	Not Applicable	**Is Multi Currency Allowed For BOQ**	No
Is Multi Currency Allowed For Fee	No	**Allow Two Stage Bidding**	No

Cover Details, No. Of Covers - 2

Cover No	Cover	Document Type	Description
1	Fee/PreQual/Technical	.pdf	Technical Document
		.pdf	Commercial Document
2	Finance	.xls	Price Bid

Tender Fee Details, [Total Fee in ₹ * - 0.00]

Tender Fee in ₹	0.00		
Fee Payable To	Nil	**Fee Payable At**	Nil
Tender Fee Exemption Allowed	No		

EMD Fee Details

EMD Amount in ₹	0.00	**EMD through BG/ST or EMD Exemption Allowed**	No
EMD Fee Type	fixed	**EMD Percentage**	NA
EMD Payable To	Nil	**EMD Payable At**	Nil

Work / Item(s)

Title	DEGASSER BLOWER WITH MOTOR AND ACCESSORIES				
Work Description	SUPPLY OF DEGASSER BLOWER WITH MOTOR AND ACCESSORIES AND ITS MANDATORY SPARES AS PER TECH. SPEC. ROS 6315 REV 00 AND ROS 4261 REV 01 FOR 2 x 660 MW Udangudi STPP				
Pre Qualification Details	AS PER TENDER DOCUMENT				
Independent External Monitor/Remarks	NA				
Tender Value in ₹	NA	**Product Category**	Miscellaneous Goods	**Sub category**	NA
Contract Type	Tender	**Bid Validity(Days)**	120	**Period Of Work(Days)**	187
Location	UDANGUDI/RANIPET	**Pincode**	628203	**Pre Bid Meeting Place**	NA
Pre Bid Meeting Address	NA	**Pre Bid Meeting Date**	NA	**Bid Opening Place**	RANIPET
Should Allow NDA Tender	No	**Allow Preferential Bidder**	No		

Critical Dates

Publish Date	12-May-2022 12:00 PM	**Bid Opening Date**	02-Jun-2022 05:00 PM

Document Download / Sale Start Date	12-May-2022 12:05 PM	**Document Download / Sale End Date**	02-Jun-2022 11:00 AM
Clarification Start Date	12-May-2022 12:05 PM	**Clarification End Date**	01-Jun-2022 05:00 PM
Bid Submission Start Date	12-May-2022 01:00 PM	**Bid Submission End Date**	02-Jun-2022 11:00 AM

Tender Documents

NIT Document

S.No	Document Name	Description	Document Size (in KB)
1	Tendernotice_1.pdf	DEGASSER BLOWER WITH MOTOR AND ACCESSORIES AND ITS MANDATORY SPARES	328.04

Work Item Documents

S.No	Document Type	Document Name	Description	Document Size (in KB)
1	Tender Documents	Commercial-Document.pdf	COMMERCIAL DOCUMENT	2961.22
2	Tender Documents	Technical-Specification-QAP.pdf	PQR AND TEHNICAL SPECIFICATION AND QAP DOCUMENT	3234.71
3	BOQ	BOQ_12931.xls	PRICE BID BOQ	288.00

Tender Inviting Authority

Name	AVINASH V
Address	DY MANAGER PURCHASE BHEL RANIPET

	BHEL: BAP: RANIPET Water Systems	Ref:	RWT11086 & RWT11087
		Dt:	20.04.2022
	Pre-Qualification requirement for Degasser Blower with motor & accessories	Rev :	00

The Qualification requirements (QR) for Degasser Blower with motor & accessories detailed below and Bidders should meet the same. Offers of bidders who do not meet qualification requirement will not be considered.

1. Bidder should be a Centrifugal Air Blower manufacturer or Direct Dealer of Centrifugal Air Blower manufacturing with OEM's authorization & OEM's undertaking for supply, services & guarantee etc.

2. Bidder should have supplied at least 1 no. of Centrifugal Air Blower in power /industrial/municipal application meeting the following criteria:

Sl. No.	Description	Details
a.	Type of Blower	Centrifugal Air Blower
b.	Material of Construction	i) Casing: MS/CS/CI ii) Impeller: MS/CS/CI
c.	Flow (m3/hr.) minimum.	350
d.	Total Discharge head (psi).Minimum	(0.1)

3. Bidder to provide supporting documents meeting QR such as GA drawing/Approved Data Sheet/ Purchase Order Copy/ Inspection Clearance Report.

4. Such Reciprocating Air Blower referred above should have been supplied at least one year before techno commercial bid opening.

General Conditions:

1. Bidder shall furnish necessary documentary evidence in original / notarized (legible) copy as a proof of meeting the qualifying criteria for the review by BHEL. Acceptance of documentary evidence rests with BHEL.

2. Bidders who defaulted, in any of the previous tenders floated by BHEL are not permitted to respond. Such offers, if found later, will not be considered for evaluation.

3. After receipt of offers, during scrutiny, if any vendor found to have been banned by BHEL, then their offer will be summarily rejected at any stage.

	BHEL: BAP: RANIPET Water Systems Pre-Qualification requirement for Reciprocating Air Blower	Ref:	RWT11086 & RWT11087
		Dt:	20.04.2022
		Rev :	00

Annexure-I
Qualification
Datasheet

A. Centrifugal Blower Details: -

Date of Supply :

Sl. No.	Parameters	Unit	Description/Values
01	Type of Blower		
02	MOC Of Blower : Casing Impeller Shaft		
03	Duty Point Flow	m3/hr.	
04	Duty Point Head	psi	

B. Customer details: -

a. Name :
b. Designation :
c. Mobile :
d. Land line :
e. Fax :
f. Email id :
g. Postal address :

Signature of the Bidder with seal

BHARAT HEAVY ELECTRICALS LIMITED

RANIPET- 632 406.

TECHNICAL SPECIFICATION

FOR

DEGASSER BLOWER & ACCESSORIES

00	23.07.2021	A.Kumar ABH	Srivatsan SS	SM	Fresh Issue
Rev.No	Date	Prepared	Checked	Approved	Remarks

	TECHNICAL SPECIFICATION FOR DEGASSER BLOWER & ACCESSORIES	SPEC.NO.ROS:6315 REV. NO: 00

1.0 PROJECT INFORMATION

1	Owner	:	UDANGUDI STPP -TANGEDCO
2	Project Title	:	UDANGUDI SUPER CRITICAL THERMAL POWER PROJECT, (2 x 660 MW)
3	Location	:	UDANGUDI

2.0 SCOPE

The intent of this specification is to cover Design, Engineering, Manufacturing, shop testing, supply and ensuring performance guarantee at site of Degasser Blowers for Degasser Tower as per this specification.

The scope of supply shall include but not limited to the following.

a. Degasser Blower: 4 Sets.
   Scope per set of Blower
   - Casing: 1 No.
   - Fan Blade: 1 Set
   - Fan Back Plate: 1 Set
   - Fan Cover Stand: 1 No.
   - Stand: 1 No.
   - Base frame & Discharge Silencer: 1 No.
   - Fan Hub: 1 Set.
   - Bearings: 1 No.
   - Pulleys (M& F): 1 No.
   - Shaft: 1 No.
   - Belt: 1 No.
   - Filter Plenum: 1 No.
   - Foundation Bolts: 1 No.
   - Electric Motor: 1 set
   - Inlet/Outlet Damper- 1 No.
   - Fasteners (Internal/External) SS316: 1 Set
   - Anti vibration mountings- 1 No.
   - Inlet Filter & Silencer – 1 No.
   - Flexible Discharge Connection: 1 No.

b. Technical Specification for LT Motors as per Spec. ROS: 4261/Rev.01
c. Mandatory spares as per specification – 1 set

	TECHNICAL SPECIFICATION FOR DEGASSER BLOWER & ACCESSORIES	SPEC.NO.ROS:6315 REV. NO: 00

Items though not mentioned but needed to make the system complete as stipulated under these specifications are also to be supplied unless otherwise specifically excluded.

1.1 It is not the intent to specify all the details of the design & manufacture. However, the equipment shall conform in all respects to high standard of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to Engineer / Customer, who will interpret the meaning of drawing & the specification and shall be entitled to reject any work or material, which is not in full accordance herewith.

1.2 In case of any deviation, the Bidder shall indicate the same, clause by clause in the deviation schedule. In the absence of the same it will be construed that the bid confirms strictly to the specification.

1.3 General terms & conditions, instructions to the bidder & other attachments referred to elsewhere are part of this specification.

1.4 The order of priority of this specification is as follows:
a. Technical requirement/Equipment Specification

Any contradiction either between various parts or contents of the specification shall be a matter for clarification to be obtained by the bidder. The Customer's decision shall be final. However, as a general guideline the details furnished in the Equipment specification shall prevail.

3.0 TECHNICAL DETAILS & REQUIREMENTS:

3.1 BLOWER

a. General Details

Service	: To supply air to Degasser Tower
Location	: Outdoor on RCC tank/ Roof Top
Fluid Handled	: Ambient Air.
Duty	: Continuous

b. Material of construction

- Casing	: MS/ CS/ CI
- Impeller	: MS/ CS/ CI
- Shaft	: EN8 / ASTM A 321/ ASTM A276 TP316
- Shaft sleeve	: EN8 / ASTM A 321/ ASTM A276 TP316

- Bearings : SKF/FAG
- Fasteners : SS316
- Base plate : MS Fabricated-Epoxy coated (Min. thick.10mm)

Note :

1) The Degasser Blowers internal (Casing, Impeller, Duct etc.) should be lined/ painted suitably considering the Corrosive (Near the Sea Shore) Environment.

3.2 DESIGN DETAILS

Sl. No.	Parameters / Name	Unit	DEGASSER BLOWER
01	Capacity	m^3/hr.	792
02	Discharge Pressure	Kg/cm^2	0.01
03	Suction Pressure		Atmospheric
04	Duty		Continuous
05	Type of Impeller		Backward Curved
06	Quantity		4 NOS (2W+2S)
07	Make		Vendor to Specify
08	Model No.		Vendor to Specify
09	Location		Outdoor
10	Type of Blower		Centrifugal oil free
11	Fluid to be handle		Ambient Air
12	Testing code		Testing as per Approved QAP
13	Desired Noise level (without enclosure)	dBA	85 (at 1 m Distance)
14	Drive		Belt driven by Electric Motor
15	Terminal Flange		ANSI B16.5 150#.

4.0 ELECTRIC MOTOR:

Refer to Specification No. ROS:4261, Rev:01 enclosed separately with this specification.

	TECHNICAL SPECIFICATION FOR DEGASSER BLOWER & ACCESSORIES	SPEC.NO.ROS:6315 REV. NO: 00

5.0 POWER TRANSMISSION:

a. Type	: 'V' Pulleys & Belts suitable for blower & Motor speed / Direct Driven / Indirect Driven
b. Application	: To drive above blower by electric motor.
c. Accessories	: Belt guard, fasteners etc.

6.0 BASE FRAME:

Epoxy coated steel base frame to mount the above blower, motor, belt guard and accessories. Necessary anti-vibration mountings, foundation bolts, adjusting screws, special tools etc., shall be supplied along with the blower.

7.0 OTHER ACCESSORIES:

As per the Degasser Blower Requirement in order to make the equipment complete in all respects.

8.0 MANDATORY SPARES

The price for the mandatory spares shall be given separately and shall not be included in the main supply. Mandatory spares shall be packed separately with detailed packing list (items should not be packed along with main supply items)

All spares supplied under this Contract shall be strictly interchangeable with the parts for which they are intended for replacements. The spares shall be treated and packed for long storage under the climatic conditions prevailing at site e.g. small item shall be packed in sealed transparent plastic bags with desiccator packs as necessary.

Each spare shall be clearly marked or labeled on the outside of the packing with its description. When more than one spare part is packaged in a single case, a general description of the contents shall be shown on the outside of such case and a detailed list should be enclosed. All cases, containers and other packages must be suitably marked and numbered for the purpose of identification.
Bidder to quote for the mandatory spares as envisaged in the electrical specification ROS: 4261 Rev: 01.

9.0 GENERAL REQUIREMENTS

Only latest revision of standards shall be used.

9.1 Documents along with the bid.

The following information / documents shall be submitted along with the technical offer:

a. Enclosed datasheet duly filled as per Annexure-1
b. Typical quality plan.
c. Typical cross section drawings showing internal arrangements with MOC.
d. Typical test report of the Blower.
e. Unpriced Commercial offer for the scope of supply.
f. Packing and forwarding procedure.
g. Reference list of installations where blowers with similar duty conditions are in operation.
h. Any deviation shall be specifically mentioned in the enclosed deviation format Annexure 2.

In case of any deviation, the Bidder shall indicate the deviation, clause by clause in the deviation format attached in Annexure-2. If there is no deviation "NIL" statement shall be furnished. In the absence of non-attachment of this Annexure-2 it will be construed that the bid confirms strictly to the specification. Acceptance or rejection of the offer with or without deviations (either fully or partially) is sole discretion of the purchaser without seeking further clarification from the bidder.

NOTE:

Bidders to note that failing to submit the above documents, the bid shall be considered as incomplete and liable for rejection.

9.2 Documents after order for BHEL's review / approval.

The following information / documents shall be submitted in the event of order for BHEL's review and approval before manufacturing.

a. Enclosed data sheet duly filled as per Annexure-1.
b. Quality plan in BHEL format.
c. Design calculations for blowers as per design code.
d. Detailed assembly & cross sectional drawings with bill of material for blower, motor, V-belt, pulley, base frame, valves, silencers etc., with lifting arrangement and location for blower & motor.
e. Performance curve for the blower.
    - Capacity Vs. Head
    - Capacity Vs. Efficiency
    - Capacity Vs. Power

- Speed Vs. Torque

9.3 The following information / documents shall be submitted in the event of order for information.

a. Necessary material test certificates.
b. Necessary hydraulic test certificate.
c. Erection manual.
d. Operation & Maintenance manuals.
f. Necessary performance and guarantee certificate.

NOTE: 1) Bidder to confirm in their offer that the documents in above Cl.8.2 & 8.3 will be provided.

2) Any item other than scope of supply required for Air Blower to make it complete in all respects should be supplied by the bidder without any additional implication.

10.0 PAINTING & COLOUR CODING

Refer to Annexure: B enclosed separately with this specification.

11.0 INSPECTION

Inspection by BHEL or BHEL's authorized agency at vendor's works. Vendor shall submit the QAP for the customer approval before start-up of the manufacturing

	TECHNICAL SPECIFICATION FOR DEGASSER BLOWER & ACCESSORIES	SPEC.NO.ROS:6315 REV. NO: 00

ANNEXURE-1

BHEL ENQUIRY / P.O. Reference No. & Date :

Indent No. / Material Code No. :

DATA SHEET FOR DEGASSER BLOWER

A. BLOWER

1. TECHNICAL PARAMETERS

a.	Material Code		:	
b.	Make		:	
c.	Model		:	
d.	Medium handled		:	
e.	Temperature range	Deg. C	:	
f.	Rated flow	Cu.m/Hr.	:	
g.	Total Head – Discharge	PSIG	:	
h.	Shut off Pressure	bar(g)	:	
i.	Design Pressure	bar(g)	:	
j.	Blower efficiency at duty point	%	:	
k.	BHP reqd. For Blower at duty point	KW	:	
l.	Maximum BHP required	KW	:	
m.	Operating range from duty point	%	:	
n.	Rated speed	rpm	:	
o.	Noise level at duty point with silencer		:	dBA at 1m distance
p.	Vibration level – Displacement microns		:	
	– Velocity (Peak) mm/sec		:	
q.	Rotation of shaft viewing from drive end		:	

	TECHNICAL SPECIFICATION FOR DEGASSER BLOWER & ACCESSORIES	SPEC.NO.ROS:6315 REV. NO: 00

2. CONSTRUCTION DETAILS

a. Suction filter silencer specification :

b. Discharge silencer specification :

c. Material of construction

- Blower casing :
- Impeller :
- Shaft :
- Others if any :

d. Type of bearings & Make :

e. Bearing lubrication :

f. Type of seal & Make :

g. Blower weight kg :

h. Moment of Inertia at Blower rotor kgm^2 :

i. Performance curve reference No. :

j. Foundation Drawing No. :

k. Blower dimension L X W X H mm :

B. POWER TRANSMISSION

a. Pulley PCD Motor / Blower mm :

b. Type of mounting Motor / Blower :

c. No. of Belts :

d. Belt section & PCD :

	TECHNICAL SPECIFICATION FOR DEGASSER BLOWER & ACCESSORIES	SPEC.NO.ROS:6315 REV. NO: 00

e. Belt guard : Yes / No.

C. BASE FRAME

a. Material :

b. Dimension detail L X W X H mm :

D. ACCESSORIES

a. List of special tools :

b. Flexible connector Size, Rating :

c. Filter restrictor Indicator specification :

d. Pressure Relief Valve size, rating :

e. Non-return valve size, rating :

f. Pressure gauge size, rating :

g. Other accessories if any :

E. GENERAL

a. Overall assy. Dimensions L x W x H mm :

b. Shipping package dimensions mm :

c. Total assembly weight kg :

d. Dimensional drawing No. :

e. Total shipment weight kg :

	TECHNICAL SPECIFICATION FOR DEGASSER BLOWER & ACCESSORIES	SPEC.NO.ROS:6315 REV. NO: 00

FORM FOR TECHNICAL DEVIATIONS (If any)

Annexure-2

Sl. No	SEC / CLAUSE NO.	Specification	Statement of Deviations/variations	Reason for deviation	Cost of withdrawal

Date: Signature & seal of the Bidder

BHARAT HEAVY ELECTRICALS LIMITED,

RANIPET- 632 406.

TECHNICAL SPECIFICATION

FOR

LT MOTOR

Rev.No	Date	Prepared	Checked	Approved	Remarks
01	24.02.2020	AJV	MEGA	VNS	Mandatory spares Edited
00	12.12.2019	AJV	MEGA	VNS	Fresh issue

	2 X 660 MW, UDANGUDI STPP (STAGE-1)	BAP-RANIPET
BHEL	SPECIFICATION FOR LT MOTOR	No: ROS:4261, REV: 01

1. INTENT OF SPECIFIATION

The specification covers the design, materials, constructional features, manufacture, inspection and testing at manufacturer's work, and packing of Low voltage (LV) squirrel cage induction motors along with all accessories for driving auxiliaries in thermal power station. All motors shall be chosen for non-hazardous SAFE area application.

2. SUPPLY OF LT MOTORS

All equipments, system and service covered under this specification shall comply with the requirements of the latest statutes regulations and safety codes as applicable in the locality where the equipments/systems will be installed. The Bidder shall fully acquaint himself with these requirements and shall ensure compliance with them. The equipments, systems and services furnished as per this specification shall conform to the codes and standards elsewhere in the specification. However, in the event of any conflict between the requirements of two standards or between the requirements of any standard and this specification, the more stringent requirements shall apply unless confirmed otherwise by the Owner in writing. The decision of the Owner shall be final and binding in all such cases.

2.1. CODES AND STANDARDS

All motors shall confirm to the latest editions including all applicable amendment of relevant IS, IEC standards/Publications and all other applicable ANSI, ASME, IEEE, NEC, NEMA, ISA, DIN, VDE, NFPA, IEC, EIA, TIA standards. In case any other standard is followed that ensures equal or better quality, may be accepted. However, the English version of the Standard adopted shall be submitted. Bidder to note that in no case, OEM/manufacturers own standards shall be accepted.

Motors shall fully comply with latest edition, including all amendments and revision, of following codes and standards. Any other applicable Indian standards for any component part even if not covered in the list shall also be followed.

a)	IS: 325	Three phase induction motors
b)	IS: 12615	Energy efficient induction motors
c)	IS: 900	Code of practice for installation and maintenance of induction motors
d)	IS: 996	Single-phase AC induction motor for general purpose
e)	IS: 1231	Dimensions of three-phase foot-mounted induction motors
f)	IS: 2223	Dimensions of flange mounted AC induction motors
g)	IS: 4029	Guide for testing three-phase induction motors
h)	IS: 8789	Values of performance characteristics for three-phase induction motors
i)	IS: 13555	Guide for selection and application of 3-phase AC induction motors for different types of driven equipment
j)	IS: 5571	Guide for selection of electrical equipment for hazardous areas
k)	IS: 12065	Permissible limits of noise level for rotating electrical machines
l)	IS: 12075	Mechanical vibration of rotating electrical machines
m)	IS 60034-5	Degree of protection provided by Integral design of rotating electrical machines
n)	IS 60034-8	Terminal marking and direction of rotation
o)	IS 60079-1	Equipment protection by flame proof enclosure
p)	IS 60034-1	Rotating electrical machines.
q)	IS 60079	Explosive atmospheres
r)	IS/IEC 60529	Degrees of protection provided by enclosures (IP code)
s)	IEC 60034	Rotating electrical machines.
t)	IS 3177	Code of practice for Design, Manufacture, Erection and testing of Cranes and Hoists

2.2. SYSTEM PARAMETERS

Motors having a voltage rating of below 1000V are referred to as low voltage (LV) motors. Maximum rating of the LV motor shall be 160 KW. Motors rated 0.20 KW and below shall be 240v, 1Ph, 50Hz motors and all other motors will be 415V, 3 Ph, 50 Hz motors unless otherwise specified. Space heater supply 230V+/-10%, 1Ph, 50Hz+/-5%, 10% (Absolute sum)

S. No.	Description	LT System
1	Voltage level	240 V: up to 0.2 kW 415 V: >0.2 kW and up to200 kW.
2	System earthing	415 V system solidly grounded.
3	Fault withstand rating of motor terminal box (Breaker operated)	415 V system : 50/65 kA for 0.2 second

2.3. DESIGN REQUIREMENTS

2.3.1 Duty

1. For the purpose of design of equipments /systems, an ambient temperature of 50 °C and relative humidity of 95% shall be considered. The equipment shall operate in hot, humid and a highly polluted (coal and fly ash) environment.
2. All AC motors shall be squirrel cage three phase/single phase induction motors. All the motor shall be designed for bi-directional rotation.
3. All motors shall be continuously rated (S1 duty). However, crane and hoist motors shall be intermittent (S4 duty), 40% cyclic duration factor.
4. All the motors shall be suitable for direct on-line starting with any type of breaker on full load. Where variable voltage and variable frequency (VVFD) operation is envisaged through VVFD drives, motors shall be specially designed for such application.
5. All LV motors with S1 duty shall be compulsorily of Energy efficient level IE 3 as per IS 12615. For VFD controlled motors it shall be level IE 2 as per IS 12615

2.3.2 Design Margin

1. The motor rating shall be arrived at considering 15% margin over the duty point input or 10% over the maximum demand of the driven equipment, whichever is higher, considering highest system frequency.
2. Whenever the basis for motor ratings are not specified in the corresponding mechanical specification sub-sections, maximum continuous motor ratings shall be at least 10% above the maximum load demand of the driven equipment under entire operating range including voltage and frequency variations. The motor characteristics shall match the requirements of the driven equipment so that adequate starting, accelerating; pull up, breakdown and full load torques are available for the intended service.
3. Service shall be considered as 1.0 only.
4. Motors that are operated through VFD as per process requirement shall meet IEC 60034-17 and the motor insulation shall be able to withstand the peak voltage, dV/dt and rise time as specified in IEC 60034-17 (for standard motors when controlled by VFD drives). In addition, these motors shall be provided with insulated bearings from motor frame size 160 and onwards on the non-driving end side of the motor. Vacuum Pressure Impregnation (VPI) shall be provided to windings for motors identified with VFD operation. This shall also have no additional cost implication to BHEL.

2.4. STARTING REQUIREMENTS

1. Motor characteristics such as speed, starting torque, break away torque and starting time shall be properly co-ordinated with the requirements of driven equipment. The accelerating torque at any speed with the minimum starting voltage shall be at least 10% higher than that of the driven equipment.

2. Starting Voltage requirement motors :80 % of rated voltage for all motors. Motors shall be capable of starting and accelerating the load with direct on line starting without exceeding acceptable winding temperature.
3. Motors shall be capable of restarting under full load after a momentary loss of voltage with the possibility of 150 % nominal voltage during fast bus transfer.
4. The motor shall be designed for direct on line starting at full voltage. Starting current shall not exceed 6 times full load current for all auxiliaries, subject to IS tolerance.
5. The motor shall be capable of withstanding the stresses imposed if started at 110% rated voltage.
6. Transient voltage dip on starting of the largest motor with DOL shall be limited to 20% of the nominal system voltage at the voltage terminals.

2.5. TORQUE REQUIREMENTS

1. Accelerating torque at any speed with the lowest permissible starting voltage shall be at least 10% motor full load torque.
2. Pull out torque at rated voltage shall not be less than 205% of full load torque. It shall be 275% for crane duty motors.
3. Motors subjected to reverse rotation shall be designed to withstand the stresses encountered when starting with non-energized shaft rotating at 125% of rated speed in reverse direction.

2.6. The following frequency of starts shall apply

Continuous duty motors shall be suitable for the following starting requirements under the specified conditions of load, torque and inertia.

1. No. of consecutive hot starts shall be 2 (with initial temperature of the motor at full load operating level).
2. No. of consecutive cold starts shall be 3 (with initial temperature of the motor at ambient temperature).

2.7. RUNNING REQUIREMENTS

1. Minimum voltage required for starting the motors shall be 85% of rated voltage
2. Motors shall run satisfactorily at a supply voltage of 75% of rated voltage for 5 minutes with full load without injurious heating to the motor.
3. Motor shall not stall due to voltage dip in the system causing momentary drop in voltage up to 70% of the rated voltage for duration of 2 secs.

2.8. STRESS DURING BUS TRANSFER

1. 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.
2. The motors shall be suitable for bus transfer schemes provided on the 11 kV, 3.3 kV/415V systems without any injurious effect on its life.
3. Motors shall withstand the voltage, heavy inrush transient current, mechanical and torque stress developed due to the application of 150% of the rated voltage for at least 1 sec. caused due to vector difference between the motor residual voltage and the incoming supply voltage during occasional auto bus transfer.
4. Motor and driven equipment shafts shall be adequately sized to satisfactorily withstand transient torque under above condition.
5. The max. vibration velocity or double amplitude of motors vibration as measured at motor bearings shall be within the limits specified in IS: 12075.

2.9. LOCKED ROTOR WITHSTAND TIME

1. Locked rotor current of the LV motor shall not exceed 600% of full load current inclusive of IS tolerance.
2. The locked rotor withstand time under hot condition at 110% rated voltage shall be more than motor starting time at minimum permissible voltage of 80% rated voltage by at

least 3 seconds or 15% of the accelerating time whichever is greater. Provision of speed switch shall be avoided to the extent possible.

3. For the LT motors having starting time up to 20 seconds at minimum permissible voltage, the locked rotor withstand time under hot condition at highest voltage limit shall be at least 2.5 seconds more than the starting time.
4. For the motors having starting time more than 20 seconds and up to 45 seconds at minimum permissible voltage, the locked rotor withstand time under hot condition at highest voltage limit shall be at least 5 seconds more than the starting time.
5. For motors having starting time more than 45 seconds at minimum permissible voltage, 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. Speed switches mounted on the motor shaft shall be provided in cases where above requirements are not met.
7. When a speed switch is mounted on the motor shaft, the same shall remain closed for speeds lower than 20% and open for speeds above 20% of the rated speed. The speed switch shall be capable of withstanding 120% over speed in either direction of rotation.
8. Hot thermal withstand curve shall have a margin of at least 10% over the full load current of the motor to permit relay setting utilising motor rated capacity.

2.10. CONSTRUCTIONAL FEATURES

1. Canopy shall be provided for outdoor motors.
2. Bidder shall provide fully compatible electrical system, equipments, accessories and services.
3. 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.
4. **Bearings**

a. Motor shall be provided with antifriction bearings, unless sleeve bearings are required by the motor application. Bearings shall be provided with seals to prevent leakage of lubricant or entrance of foreign matters like dirt, water etc. into the bearing area.

b. Sleeve bearings shall be split type, ring oiled with permanently aligned, close running shaft sleeves. Grease lubricated bearings shall be pre-lubricated and shall have provisions for inservice positive lubrication with grease nipple and relief holes. For sleeve bearings, the bearing housing shall be preferably in end shield itself.

c. Vertical shaft motors shall be provided with thrust and guide bearings. Thrust bearing of tilting pad type is preferred. However, if anti-friction bearings can take vertical thrust, thrust and guide bearings are not required.

d. All motors below 15 kW shall be provided with sealed ZZ bearings.

e. For motors rated above 1000 KW having shaft length more than 1.5 M shall have insulated bearings to prevent flow of shaft currents.

f. For all VFD operated motors shall have insulated bearings to prevent flow of shaft currents.

5. Motors shall be designed to easy access for drilling holes through motor feed of mounting flange for installation of dowel pins after assembly of the motor and driven equipment.
6. For bearing temperature measurement, duplex RTDs shall be provided for each bearing and shall be wired up to the terminal box.
7. Degree of Protection: Motors and Cable Box: IP 55
8. Non-hygroscopic, oil resistant, flame resistant
9. Suitable single phase space heaters shall be provided on motors rated 30 kW and above to maintain windings in dry condition when motor is standstill. Separate terminal box for space heaters & RTDs shall be provided.

10. Motors upto 160KW shall have Totally Enclosed Fan Cooled (TEFC) enclosures, the method of cooling conforming to IC-0141 or IC-0151 of IS: 6362. Motors rated above 160 KW shall be Closed Air Circuit Air (CACA) cooled
11. Motors shall be designed with cooling fans suitable for both directions of rotation.
12. Motors shall not be provided with any electric or pneumatic operated external fan for cooling the motors.
13. Frames shall be designed to avoid collection of moisture and all enclosures shall be provided with facility for drainage at the lowest point.
14. In case of continuous operation at extreme voltage limits the temperature limits specified in table-1 of IS:325 shall not exceed by more than 10 deg C.
15. Winding and insulation
    a. Winding shall be class F insulation with temperature limited to class B. Insulation shall be Non-hygroscopic, oil resistant, and flame resistant. Winding, fittings and hardware shall be corrosion resistant. Winding shall be tropicalized and suitably varnished, baked and treated for operating satisfactorily in humid and corrosive atmosphere.
    b. For the VFD operated drives, insulation shall be designed to take care of stresses due to high DV/DT. Motors shall be wound with dual coated winding wires and impregnated with VPI process. Further for such application, insulated bearings shall be provided to avoid circulating current caused by shaft induced voltages.
    c. All insulated winding shall be of copper.
    d. Two hot starts in succession, with motor initially at normal running temperature

16. Noise and vibration
    a. The peak amplitude of the vibration shall be within IS specified limits.
    b. Noise level and vibration shall be limited within the limits prescribed in IS: 12065 & IS: 12075 respectively. Motors shall withstand vibrations produced by driven equipment.
17. Grounding
    Motor body shall be grounded at two earthing points on opposite sides with two separate and distinct grounding pads complete with tapped holes, GI bolts and washers.

    The grounding connection shall be suitable for accommodation of ground conductors as follows:

LT Motors	
a. Fractional HP	8 SWG GI wire
b. Up to 25 KW	25 x 3 mm flat
c. 25 to 125 KW	25 x 6 mm flat
d. above 125 KW	50 x 6 mm flat
Control Desks, Control/relay panels, LDBs, PDBs, Lighting Panels, Power receptacles, Lighting Masts, Lighting Poles	25 x 3 mm flat
LPB stations, Limit/Pressure switches, Starters, CT/PT terminal Boxes	8 SWG GI wires
Columns, Fence, Gates, Cable trays etc	50 x 6mm flat

18. The cable terminal box shall have a separate grounding pad, Terminals and Terminal Boxes.
    a. The motor terminal box shall be suitable for withstanding the maximum system fault current for a duration of at least 0.25 seconds.
    b. Terminals, terminal leads, terminal boxes, windings tails and associated equipment shall be suitable for connection to a supply system having a short circuit level, specified below.
    c. Unless otherwise stated, motors of rating 110 kW and above will be controlled by circuit breaker and below 110 kW by switch fuse-contactor. The terminal box of

motors shall be designed for the fault current Short time rating for terminal boxes below 110 kW (Contactor controlled) shall be 50 KA protected by fuse for 0.25 sec

d. Unless otherwise specified or approved, phase terminal boxes of horizontal motors shall be positioned on top or left hand side of the motor when viewed from the non-driving end.
e. Connections shall be such that when the supply leads R, Y & B are connected to motor terminals A, B & C or U, V & W respectively, motor shall rotate in an anticlockwise direction when viewed from the non-driving end. Where such motors require clockwise rotation, the supply leads R, Y, B will be connected to motor terminals A, C, B or V, W & V respectively.
f. Permanently attached diagram and instruction plate made preferably of stainless steel shall be mounted inside terminal box cover giving the connection diagram for the desired direction of rotation and reverse rotation.
g. Motor terminals and terminal leads shall be fully insulated with no bar live parts. Adequate space shall be available inside the terminal box so that no difficulty is encountered for terminating the cable.
h. Degree of protection for terminal boxes shall be IP 55 as per IS 4691.
i. Separate terminal boxes shall be provided for space heaters. If this is not possible in case of LV motors, the space heater terminals shall be adequately segregated from the main terminals in the main terminal box. Detachable gland plates with double compression brass glands shall be provided in terminal boxes.
j. Phase terminal boxes shall be suitable for 360 degree of rotation in steps of 90 degrees for LV motors.
k. Suitable Double Compression type Cable glands and cable lugs shall be provided. Cable lugs and lugs shall be as specified elsewhere in the specification. The cable sizes will be informed during detail engineering.
l. Two separate earthing terminals suitable for connecting G.I. or MS strip grounding conductor of size suitable for solidly grounded system shall be provided on opposite sides of motor frame. Each terminal box shall have a grounding terminal.

19. Painting: Motor including fan Painting shall be carried out by an approved process. Pretreatment shall conform to applicable standard. The equipment shall be subject to a coat of red oxide primer paint. All inside and outside surface shall be painted with epoxy based paint. The final thickness of paint film on steel shall not be less than 100 microns. Finish shade shall be 631 of IS: 5 (smoke grey).
20 Lifting Provisions: Motor weighing 25 kg or more shall be provided with eye bolt or other adequate provision for shifting.

2.11. GENERAL

1. Motors provided for similar drives shall be interchangeable.
2. Suitable foundation bolts are to be supplied along with the motors.
3. Necessary fitments and accessories shall be provided on motors in accordance with the latest Indian Electricity rules 1956
4. All motors rated above 30 kW shall be provided with space heaters to maintain the motor internal air temperature above the dew point. Unless otherwise specified, space heaters shall be suitable for a supply of 240V AC, single phase, 50 Hz.
5. Name plate with all particulars as per IS: 325 shall be provided
6. Necessary cable glands & cable lugs for the motors shall be supplied by the bidder
7. Motors with heat exchangers shall have dial type thermometer with adjustable alarm contacts to indicate inlet and outlet primary air temperature.
8. Name Plate: Motor shall have stainless steel nameplate(s) showing diagram of connections, all particulars as per IS: 325 / IS: 12615 and shall also have 'BEE' marking.

2.12. INSPECTION AND TESTING

1. All materials, components and equipment covered under this specification shall be procured, manufactured, as per the Approved quality plan.

2. LV motors of type-tested design shall be provided. Valid type test reports not more than 5 year shall be furnished. In the absence of these, type tests shall have to be conducted by manufacturer without any commercial implication to purchaser.
3. All motors shall be subjected to routine tests as per IS: 325. Noise level measurement and vibration test as per standards shall be conducted on all motors.
4. Inspection: for Motors Upto 55KW –Inspection by BHEL, for motors with a rating more than 55KW inspection is by BHEL, Customer and Consultant.

2.12.1. LIST OF TESTS TO BE CONDUCTED FOR HV, MV and LV MOTORS

1. TYPE TESTS

Equipment offered shall be of type tested and proven type. Type test certificates for test conducted earlier on similar rating shall be furnished for the motors rated 30 kW and above.

The following type tests shall be conducted on LT motors.

a. Measurement of resistance of windings of stator and wound rotor.
b. No load test at rated voltage to determine input current power and speed
c. Full load test to determine efficiency power factor and slip.
d. Temperature rise test.
e. Momentary excess torque test.
f. High voltage test.
g. Test for vibration severity of motor.
h. Test for noise levels of motor
i. Test for degree of protection

2. ROUTINE TESTS

The following routine tests shall be carried out for the motors as per applicable standards.

a. IR of Winding before and after HV tests
b. HV test on main winding space heater, RTD, BTD
c. Resistance measurement
d. No load run test Major Electrical
e. Phase sequence and direction of rotation
f. Vibration check Major Electrical
g. Reduced voltage running test
h. Locked rotor test at reduced voltage
i. Record of RTD & BTD resistance at the end of no load test
j. Test on space heater & RTD
k. Visual Control of terminal box and verification of construction with respect to short tested terminal box.

3. INSPECTION AND TESTING AT SITE

Insulation resistance of 415V motors shall be measured between the winding of the machine and its frame by means of a 500/1000V megger. A minimum value of 1 mega ohm for 415V motors shall be considered a safe value. In case of lower I.R. Value, the insulation value shall be brought up by any of the following methods as desired by the Site Engineer:

a. Blowing hot air in case of big motors.
b. Putting the motor in electric oven in case of smaller motors.
c. Placing heaters or lamps around and inside in case of small motors after making suitable guarding and covering arrangements so as to conserve the heat.

4. Site Test

The following minimum tests/ checks shall be conducted at site. Any other tests/ checks as per the manufacturer's recommendation shall also be carried out

a. Measurement of vibration.
b. Measurement of insulation resistance and polarization index.
c. Measurement of full load current.

d. Test running of the motors, checking the temperature rise and identifying the hot spot.

2.13. DRAWINGS TO BE SUBMITTED AFTER AWARD OF CONTRACT

1) OGA drawing showing the position of terminal boxes, earthing connections etc.
2) Arrangement drawing of terminal boxes.
3) Characteristic curves:
   i. Current vs. time at rated voltage.
   ii. Speed vs. time at rated voltage.
   iii. Torque vs. speed at rated voltage and minimum voltage.
   For the motors with solid coupling the above curves i), ii), iii) to be furnished for the motors coupled with driven equipment. In case motor is coupled with mechanical equipment by fluid coupling, the above curves shall be furnished with and without coupling.
   iv. Thermal withstand curve under hot and cold conditions at rated voltage and max. permissible voltage.
   v. Load performance curves.

2.14. DATA SHEET

LT MOTORS (A.C.)

1.	Application	:
2.	Type	: Energy Efficient (IE3)
3.	Frame size	:
4.	Manufacturer	:
5.	Rated output in KW	:
6.	Duty cycle	: Continuous, S1
7.	Rated voltage, no. of phases and frequency	: 415 V, 3 Ph, 50 Hz
8.	Allowed voltage variation	: ±10%.
9.	Allowed frequency variation	: (+) 3% and (-) 5%
10.	Combined voltage and Frequency Variation	: 10 % (Absolute sum)
11.	At rated Voltage and frequency	
	a. Full load current (Amps)	:
	b. Rated speed	:
	c. Full load efficiency	:
	d. Full load power factor	:
e.	Starting torque in % of FLT	:
12.	Method of starting	:
13.	Degree of protection	:
14.	Method of ventilation	:
15.	Class of insulation	: "F" (temp. rise limited to class B)
16.	Stator winding connection (For continuous run) (Delta / Star)	:
17.	Full load torque	:
18.	Breakdown torque in % of FLT	:
19.	Pull up torque in % of FLT	:
20.	Locked rotor current in Amps (600% with tolerance of 20%)	:
21.	Motor efficiency and P.F.AT	:
	a. 100 % load	
	b. 75% load	
	c. 50% load	
	d. 25% load	
22.	Locked rotor withstand time under hot/cold condition at 110 % Voltage	:

23. Maximum permissible starting time :
24. No load current in Amps. :
25. Starting time in seconds with driven equipment coupled at
    a. rated voltage :
    b. Min. Voltage :
    c. Max. Voltage :
26. Actual temperature rise over an ambient of 50°C when motor is delivering rated output
    a. By thermometer method :
    b. By resistance method : (70°C for air cooled motors)
27. Number of successive starts with driven equipment coupled and motor initially at rated load temperature :
28. Minimum voltage required by the motor to bring the driven equipment to rated speed: To be 80% of RV.
29. Resistance per phase in ohms at 20 degrees :
30. Direction of rotation from driving end :
31. Make, type and size of bearing
    a. At drive end :
    b. At Non drive end :
32. Type of mounting and shaft Orientation :
33. Location of terminal box viewed from driving end :
34. Type and number of terminals brought out :
35. Type and size of cable gland & lugs for power cables & (if applicable) space heater cable : (size will be given during Detail engg)
36. Cable gland entry side :
37. Tropical &fungicidal treatment :
38. GD^2 of the motor :
39. Weight of the motor :
40. Space heater Rating & other details (for 30KW and above motors) :

3. SPECIFICATION FOR CABLE GLANDS & LUGS

3.1. Specification for Cable Glands

a. Bidder shall provide all cable glands required for glanding the above mentioned cables both at field instrument and local control panel side, junction boxes side and at control room side.
b. Cable glands
   i. Cable glands shall conform to BS: 6121 and be of robust construction capable of clamping cable and cable armour (for armoured cables) firmly without injury to insulation.
   ii. Cable glands shall be made of heavy duty brass machine finished and nickel chrome plated. Thickness of plating shall not be less than 10 micron. All washers and hardware shall also be made of brass with nickel chrome plating Rubber components shall be of neoprene and of tested quality. Necessary cable dimensions shall be furnished to the successful contractor.
   iii. Cable glands shall be single compression for indoor use, double compression type for outdoor use. Glands for classified hazardous areas shall be double compression type flameproof and weather proof duly certified by CMRS and approved by CCE.

3.2. Cable lugs/ferrules

The cables lugs shall be conforming to IS: 8309. Machine ferruling shall be adopted.

Cable lugs for power cables shall be Aluminium solder less crimping type suitable for aluminium compacted conductor cables.
i) Copper tubular terminal end for solder less crimping to copper conductors.
ii) Cable lugs for control cable termination shall be insulated type. These lugs shall be flat type/ring type/U type to suit the terminals provided in the pan
iii) Pin type lugs shall not be used.
iv) Aluminium tubular terminal ends for solder less crimping of to Aluminium conductor.

Solder less crimping of terminals shall be done by using corrosion inhibiting compound. The cable lugs shall suit the type of terminals provided on the equipment. Lugs for control/instrumentation cables shall be PVC insulated/sleeved type.

4. LIST OF MANDATORY SPARES

	LT Motors of each type and rating		
	Description	Unit	Quantity
a)	Driving end bearing	Set	1
b)	Non driving end bearing	Set	1
c)	Terminal block for motors up to 30 Kw each rating	Nos.	10
d)	Terminal block for motors above 30 Kw each rating	Nos.	5
e)	Motors of each type & rating	Nos.	10% of installed quantity or 1 –no whichever is higher

NOTES:
1. The word 'TYPE' means the Make, Model no., Type, Range, Size/ Length, Rating, Material, accessories as applicable.
2. Wherever % age is identified, Bidder shall supply next higher rounded figure.
3. The terminology used under 'Part Description' is the commonly used name of the part and may vary from manufacturer to manufacturer.
4. Commissioning spares are part of Bidder scope of supply. Mandatory spares as indicated above do not cover commissioning spares.

4.1. INTERCHANGEABILITY & PACKING
All spares supplied under this contract shall be strictly interchangeable with the parts for which they are intended for replacements. The spares shall be treated and packed for long storage under the climatic conditions prevailing at the site. e.g. small items shall be packed in sealed transparent plastic bags with desiccators packs as necessary.

4.2. IDENTIFICATION
Each spare shall be clearly marked and labeled on the outside of the packing with its description. When more than one spare part is packed in a single case, a general description of the contents shall be shown on the outside of such case and a detailed list enclosed. All cases, containers, and other packages must be suitably marked and numbered for the purpose of identification.

4.3. CONTRACT-QUANTITIES
The quantities & mandatory spares shall be as specified herein. Any other mandatory spares not listed above however required for any instrumentation item shall also be supplied by bidder. The final quantities may require addition/deletion during the contract stage. The Bidder shall furnish unit price for each mandatory spare under appropriate schedules which shall be used for adjusting the contract price in the event of addition/deletion from contract quantities specified herein.

4.4. DOCUMENTATION
Bidder shall furnish detailed catalogue, part number and subassembly/assembly drawings with manufacturer's cross reference for each spare part. The data and information furnished shall be of nature and content as per owner's approval to enable owner procurement of these spare parts directly from the respective manufacturer.

5. PACKING AND DISPATCH

Equipment shall be packed with suitable desiccants sealed in water-proof, vapour-proof wrapping, and packed in lumber or plywood enclosures, suitably braced tied and skidded. Lumber enclosures shall be solid, not slatted.

Review by the Owner of the Bidder's proposed packaging methods shall not relieve the Bidder of responsibility for damage or deterioration to the equipment and materials specified.

All equipment and materials shall be suitably coated, wrapped or covered end boxed or crated for moist humid tropical shipment and to prevent damage or deterioration during handling and storage at the site.

All itemized list of contents shall be enclosed inside each case, and one other copy securely fastened to the outside of the case in a tin or light weight sheet metal envelope or pocket. The lists shall be plainly marked and placed in accessible locations to facilitate receipt and inspection. The packing list shall indicate whether shipment is partial or complete and shall incorporate the following information on each container, etc. according to its individual shipping number:
a) Export case markings.
b) Case number.
c) Gross weight and net weight in Kilograms
d) Dimensions in centimeters.
e) Complete description of material including order number.

Electrical equipment controls and instrumentation shall be protected against moisture and water damage. All external gasket surfaces and flange faces, couplings, motor pump shafts, bearings and like items shall be thoroughly cleaned and coated with rust preventive compound as specified above and protected with suitable wood, metal or other substantial type covering to ensure their full protection.

6. BIDDER LIST

1	KIRLOSKAR ELECTRIC CO LTD	BENGALURU/CHENNAI
2	NGEF (HUBLI) LTD	BENGALURU
3	SIEMENS INDIA LTD	JOKA
4	BHARAT BIJILEE LTD	MUMBAI
5	CROMPTON GREAVES LIMITED	CHENNAI
6	LAXMI HYDRAULICS PVT LTD	SOLAPUR
7	JYOTI LIMITED	VADODARA
8	BHEL ELECTRICAL MACHINES LTD	KASARAGOD
9	BHARAT BIJLEE LIMITED	CHENNAI
10	ABB LIMITED	CHENNAI
11	MARATHON ELECTRICAL MOTORS INDIA LIMITED	CHENNAI

Note: This Bidder list is subject to customer approval

Annexure - B

VOLUME II

SUB-SECTION 2.25

CLEANING, PROTECTIVE COATING AND PAINTING

1.0.0 GENERAL

This specification covers the general requirements related to the cleaning protective coating and painting of equipment, components and systems that are covered under main equipment / system specifications for 2x660 MW Supercritical Thermal Power Plant. The components and/or equipment shall be mechanically and /or chemically cleaned during the following stages of the Contract.

- Cleaning in workshop
- Cleaning before painting and/or corrosion protection (application of prime coat)
- Cleaning before erection and during installation.

Cleaning of fabricated component items shall be carried out after fabrication and final heat treatment or welding at manufacturer's works or at site, as appropriate. No paint shall be applied surfaces within 75 mm of field welded connections. These surfaces shall be coated with a consumable preservative and marked.

For cleaning in workshop and before painting, mechanical cleaning by power tool and scrapping with steel wire brushes shall be adopted to clear the surfaces. However, in certain locations where power tool cleaning cannot be carried out, hand scrapping may be permitted with steel wire brushes and/or abrasive paper. Cleaning with solvents shall be resorted to only in such areas where other methods specified above have not achieved the desired results. Cleaning with solvents shall be adopted only after written approval of the Owner / Engineer.

Machined surfaces shall be protected during the cleaning operations.

In the event of the surfaces not being cleaned to the Owner's satisfaction, such parts of the cleaning procedures or agreed alternatives as are deemed necessary to overcome the deficiencies shall be carried out at the supplier's sole expense.

For reclining small areas, hand cleaning by wire brushing may be permitted.

2.0.0 CODES AND STANDARDS

Painting of equipment shall be carried out as per the Codes indicated below and shall conform to the relevant IS Code for the material and workmanship.

The following codes and standards shall be followed for the surface preparation, surface protection and painting works.

IS: 5	Colors for ready mixed paints and enamels.
IS: 101	Methods of test for ready mixed paints and enamels.
IS: 104	Ready mixed paint, brushing, Zinc Chrome, priming.
IS: 158	Ready mixed paint, brushing, bituminous, black, lead free, acid, alkali, water and heat resisting.
IS: 161	Heat resistant paints
IS: 1303	Glossary of terms relating to paints.
IS: 1477	Code of practice for painting of ferrous metals in buildings (Parts I & II).
IS: 2074	Specifications for ready mixed paint, Air drying, red oxide zinc chrome priming.
IS: 2338	Code of practice for finishing of wood and wood based materials: Parts 2 schedules.

IS: 2339	Aluminum paint for general purposes, in dual container.
IS: 2395	Code of practice for painting of concrete, masonry and plaster surfaces: Part 2 schedules.
IS: 2524	Code of practice for painting of non-ferrous metals in buildings (Parts I & II).
IS: 2932	Specification for enamel, synthetic, exterior (a) undercoating, (b) Finishing
IS: 3140	Code of practice for painting asbestos cement building products.
IS: 6158	Recommended practice for design safeguarding against Embrittlement of hot dip Galvanized Iron & steel products.
IS: 6159	Recommended practice for design & fabrication of Iron &steel products prior to Galvanizing & metal spraying.
IS: 6278	Code of practice for white washing and Color - Washing.
IS: 10221	Code of practice for coating & wrapping of underground mild steel pipelines.
IS: 33	Inorganic pigments and extenders for paints –Methods of sampling & test.
IS: 13183	Aluminum paint, Heat resistant - specifications.
IS: 144	Specification for ready mixed paint brushing, petrol resisting, Air drying for Interior paints of tanks and containers, Red oxide.
IS: 9954	Pictorial surface preparation standards for painting of steel surfaces.
IS: 11883	Specification for Ready Mixed Paint, Air Drying, Red Oxide Priming for metals.
IS: 9404	Color code for identification of pipelines used in the Thermal Power Plants.
IS: 12744	Specification for Ready Mixed Paint, Air Drying, Red Oxide-Zinc Phosphate Priming.
BS: 2015	Glossary of paint selected terms.
BS: 5252	Final coat color.
BS: 7079A1/S1	Specification for rust grades and preparation grades of uncoated substrates after overall removal of previous coating.
BS: 7079A2	Preparations grades of previously coated steel substrates.
BS: 7079GrC	Surface roughness characteristics of blast cleaned steel substrates.
BS: 7079GrD	Methods for surface preparation.
BS-4232	Surface Finish of Blast cleaned steel for painting.
ASTM	American Standard for Testing Material.
ASTM A 780	Standard practice for repair of damaged galvanized coatings.
AWWA	American Water Works Association.
ASA-A-13.1-1981	Scheme for identification of piping system (American National Standard Institution).
DIN	Deutsehes Institute for Normung
S1S-055900-1967	Surface preparation standards for painting steel surfaces. (Swedish standard Institution)
SSPC-SP	Preparation Specifications (Steel structures painting council, U.S.A.).
	National Association of Corrosion Engineers, U.S.A. (NACE).

3.0.0 SCOPE OF WORK AND GENERAL REQUIREMENTS

This specification covers the surface preparation, method of application and material to be used for all coating of equipment, steel structures and piping. Steel material subjected to surface preparation on shop/site shall have minimum requirements in accordance with Rust Grade B (SSPC/SSPM Volume-2).

Coating materials according to SSPC, EN ISO, ASTM, BIS or DIN standards, shall be used. The paint shall comply with applicable laws, regulations, ordinances etc., of the local authority, state or the nation pertains to the work. The materials shall be matched with each other so that they are compatible. Coatings deviating this specification shall be subject to approval.

Standards of surface preparation and painting shall give a time to first maintenance of minimum 10 years.

The paint to be applied shall be approved by Owner.

All paints & paint material used shall be procured from approved manufacturers. Paint shall be supplied in manufacturers original containers with the description of content, specification No., colour, ref no, date of manufacture, shelf life expiry date & pot life.

The paint manufacturers shall provide coating system data sheet for each coating system to be used containing the following information

a. Surface preparations
b. Film thickness (min and max)
c. Min and max recoating intervals at relevant temperatures
d. Mixing ratio, thinner details and coating repair systems

The sample for testing the paint being used may be taken by the Owner at any time.

In general Shop fabricated equipment will be delivered to the site coated with a shop applied system or the manufacturer's standard finish in accordance with the requirements of this specification.

For equipment that has received shop prime coat, all touch-up prime coat and additional coats shall be applied in accordance with the coating schedule. It is responsibility of the vendor to ensure compatibility between shop and field applied paint systems.

Necessary precautions shall be provided to all equipment, structures to protect other surfaces from abrasive blasting, coating over spray and spatter. Damage to other surfaces or equipment shall be repaired by the vendor.

The Contractor shall submit the following for review and approval by the Owner:

a. Manufacturer's recommended paint scheme for the project
b. Latest published product & instructions for application data,
c. Procedures for surface preparation and application.
d. Pre qualification for equipments and blasting materials, product, procedure and personnel qualifications for the paint and painting systems.
e. Painting repair procedures

Painting records shall contain:

- Equipment/components/location painted
- Date of painting
- Paint details such as specification No, colour, date of manufacture, shelf life, expiry date
- Application equipments

- Ambient conditions at the time of painting
- Surface temperature
- Drying time between coating, DFT and number of coatings
- Appropriate work plan for painting.

The supply of all necessary equipments, weather protection, and scaffolding for painting to ensure work is carried out in accordance with the specification and agreed programme.

Maintenance of the paint work until completion of the contract, this shall include repair of any damaged areas caused by third party.

Disposal of painting waste resulting from painting, shall comply with applicable laws, regulations, ordinances etc., of the local authority, state or the nation pertains to the work and coating materials.

It is a mandatory requirement that all operatives working to this procedure take full cognizance and implement necessary safety precautions.

4.0.0 CLEANING AT MANUFACTURER'S WORKS

Mechanical cleaning shall preferably be carried out by abrasive blasting. The Owner is prepared to consider alternative methods such as chemical cleaning provided they achieve the necessary surface condition.

In case of chemical cleaning, the detailed procedure for chemical cleaning as well as the system for which chemical cleaning is required shall be submitted by the contractor for Owner's approval. The procedure shall comprise of pre-treatment and acid treatment to achieve cleanliness equivalent to that specified for mechanical cleaning.

Surface condition:

The Metal surfaces shall be clean and free of mil scale, rust, dirt, grease and any other deleterious matter.

Where metal surfaces are to be painted the surface profiles shall conform to the painting specification requirements.

Where this does not apply, surfaces shall have a surface texture not coarser than Grade 80 abrasive paper.

Abrasives:

Abrasives containing silica, silicates or slag residues shall not be used for water/steam side surfaces of plant except for cleaning sand castings, where hydro blasting may be employed.

For austenitic materials only, abrasives containing 98% or more of alumina, Al_2O_3, shall be used.

Removal of abrasive and debris:

After cleaning, abrasive and debris shall be thoroughly removed for components.

5.0.0 PROTECTION AT MANUFACTURER'S WORKS

As soon as all items have been cleaned and within four hours of the subsequent drying, they shall be given suitable anti-corrosion protection.

All water, air and steam side surfaces shall be protected by the application of approved water soluble corrosion inhibitors, or vapor phase inhibitors that can be subsequently removed by site water washing or steam blowing.

The gas side of steam generating plant items shall be protected by the application of temporary protective that do not require to be removed before commissioning, but which are removed during initial firing.

The rate of application of volatile corrosion inhibitors shall be at least 10 grams per square meter or 35 grams per cubic metre, whichever is the greater, except for pipes up to 300 mm diameter for which the minimum application rates shall be 5 grams per square metre.

Immediately after the protective treatment has been applied all vessels and pipes shall be suitably sealed off by discs or caps or approved alternatives to prevent ingress from the surroundings. Cylindrical plugs shall not be driven into the ends of pipes. These protective covers shall not be removed until immediately before final connection is made to the associated equipment.

6.0.0 WEATHER CONDITIONS

Painting shall be done only when the surface temperature is above 5°C. Surface temperature must be at least 3°C above dew point to ensure that condensation does not occur on the surface.

Reasonable protection against precipitation and seawater spray shall be exercised for the painting of outdoor parts.

Precautions shall also be taken against solar radiation to ensure that the specified dry film thickness of priming or finish coats is obtained.

Any prime coat exposed to excess humidity, rain, dust etc., before drying, shall be permitted to dry and the damaged area of primer shall be removed and the surface prepared and primed again.

Sheltered or unventilated horizontal surfaces on which dew may collect require more protection, and to achieve this additional top coat of paint shall be applied.

The temperature quoted as "normal" in the "Paint System Tables" refers to the average local climatic conditions.

7.0.0 SURFACE PREPARATION

In preparing any surface to be coated, all loose paint, dirt, grease, rust, scale, weld slag or spatter or any other extraneous material shall be removed and defects repaired, so as to obtain a clean, dry, even surface to receive the priming or finishing coat (s) as called for in the painting schedules. Sharp edges should be rounded, especially when tank linings have to be applied.

All machined surfaces, including flange faces, shall be suitably covered to prevent damage during surface preparation.

All surfaces should be blast cleaned whenever possible.

Surface preparation methods:

Bare steel surfaces should be prepared by one of the methods described below in order of preference and in accordance with Swedish Standard SIS 05 59 00 or Steel Structures Painting Council, SSPC, Vis 1, or DIN 55928, section 4.

The relative humidity level should not be more than 60% & the steel surface temperature at least 3° C above the dew point during dry blast cleaning operations.

a. White metal blast cleaning Sa 3 or SSPC - SP 5

Sa 3 Blast cleaning to bare metal. Mill scale, rust and foreign matter must be removed completely. Subsequently, the surface is cleaned with vacuum cleaner, clean dry compressed air or a clean brush. It must then have a uniform metallic color and correspond in appearance to the prints designated Sa 3.

b. Near white metal blast cleaning Sa 2 1/2 or SSPC - SP 10

Sa 2 1/2. very thorough blast cleaning. Mill scale, rust and foreign matter shall be removed to the extent that the only traces remaining are slight imperfections in the form of spots or stripes. Subsequently, the surface is cleaned with a vacuum cleaner, clean dry compressed air or a clean brush. It must then correspond in appearance to the prints designated Sa 2 1/2.

Mechanical cleaning should only be used when procedures (a) and (b) are not practicable.

c. Near white metal blast cleaning P Sa 2 1/2 DIN 55928

Very thorough blast cleaning. Very adhesive coatings remain. From all other surface mill scale and rust are to be removed to such an extent that the only traces remaining are slight imperfections in the form of spots or stripes. Further treatments see Sub b).

The adhesivity of residual coatings in the transition zone has to be tested even after the application of the primer.

d. Very thorough mechanical scraping and wire brushing St 3

St 3 very thorough scraping and wire-brushing - machine brushing - grinding - etc. are to be preferred. Surface preparation as for St 2. But much more thoroughly. After the removal of dust, the surface must have a pronounced metallic sheen and correspond to the prints designated St. 3.

e. Thorough scraping and wire brushing St 2

St 2 Thorough scraping and wire-brushing - machine brushing - grinding - etc. The treatment shall remove loose mill scale, rust and foreign matter. Subsequently, the surface is cleaned with a vacuum cleaner, clean dry compressed air or a clean brush. It should then have a faint metallic sheen. The appearance must correspond to the prints designated St 2.

f. Air Blasting with Non-Metallic Abrasives Powder

Whenever the "Duplex"-process is to be applied (hot dip galvanising followed by painting), prepare the hot dip galvanised surface by water washing to remove flux residues and careful air blasting with non-metallic abrasive powder. Use an abrasive with grain size from 0.1 to 0.5 mm, at a greatly reduced air pressure, max. 2 bar (g) (28 psig).

This procedure also applies to stainless steel and aluminium surfaces to be coated.

Surface preparation methods	SIS 055900	DIN 55928 Part-4	BS 4232 only for blasting	SSPC-Vis
Blasting acc to item (a),(b),(c),	Sa 3		First quality	White metal SP 5
Blasting acc to item (b)	Sa 2 1/2		Second quality	near White SP 10
Blasting acc to item (c)	Sa 2		Third quality	Commercial blast SP 6
Hand/or power tool derusting acc to item (e)	St 2		--	Hand tool cleaning SP 2
acc to items (d) and (e)	St 3		--	Power tool cleaning SP 3
Flame jet cleaning		F1	--	Flame cleaning SP 4
Pickling		Be	--	Pickling

Steel structures to be blast cleaned have to be free of pitting and other severely corroded places in accordance with B.S. 4232 and SIS 055900.

The abrasives used for blast-cleaning shall be graded flint, grit, shot or silica sand and shall be such that they will produce an average keying profile on the blast-cleaned surface of not more than 40 microns.

An air pressure of 7 bar g at the nozzle shall be used.

After blast-cleaning, all accumulated grit, dust, etc., must be removed leaving the surface clean, dry and free of mill scale, rust grease and other foreign matter.

In the event of rusting after completion of the surface preparation, the surface must be cleaned again in the manner specified.

Oil, grease, soil, cement, salts, acids or other corrosive chemicals shall be cleaned from steel surfaces, by the use of solvents, emulsions or cleaning compounds. The final wiping shall be with clean solvent and clean rags or brushes. There shall be no detrimental residue left on the surface.

Primed areas which suffer damage must be spot blasted on site to a degree of cleanliness Sa 2 1/2 before, touching up.

Protective coating must be applied as quickly as possible after the completion of surface preparation no matter what cleaning method has been used.

No blast-cleaned surface shall be allowed to remain uncoated overnight.

Steel work protected by shop primer after arrival on site must be cleaned of salt, sand, oil etc. Before the first coat of paint is applied on site. Shop primer damaged during transport must be rectified by blast-cleaning and coating before application of the site coats.

Wood surfaces shall be sanded clean. All nail holes shall be puttied and sanded before priming.

Concrete: If a protective coating is required, concrete shall be allowed to cure before painting.

8.0.0 PREPARATION OF COATING MATERIALS

All containers shall remain un-opened until required for use.

Primers and paints which have livered, gelled or otherwise deteriorated shall not be used.

The oldest primer or paint of each kind shall be used first.

All ingredients in any container shall be thoroughly mixed before use, and shall be agitated frequently during application to keep the primer in suspension.

Primer or paint mixed in the original container shall not be transferred until all settled pigment is incorporated into the body of liquid.

Mixing in open containers shall be done in a well ventilated area.

Primer or paint shall be mixed in a manner ensuring the breakdown of all lumps, complete dispersion of pigment and uniform composition.

Two-component primers shall be mixed in accordance with the manufacturer's instructions.
Thinners shall not be added to primers or paints unless necessary for proper application according to the manufacturer's instructions.
When use of thinners is permitted, it must be added to the primer or paint during mixing.

8.1.0 Primer Paint

After the surface is prepared, one coat of suitable primer shall be applied. After this first coat is dried up completely, second coat of primer shall be applied.

Primer shall be applied by brushing to ensure a continuous film without 'holidays'. The dry film thickness of each coat shall be as specified in the Annex- ANNEX 25.1.2 -Paint System of this specification.

The primer should be worked by brush application to cover the crevices, corners, sharp edges etc. in the presence of inspector.

The shades of successive coats should be slightly different in color in order to ensure application of individual coats, the thickness of each coat and complete coverage should be checked as per specification approved by Engineer before application of successive coats.

The contractor shall provide standard thickness measurement instrument with appropriate range(s) for measuring.

Elko meter for measuring the Dry film thickness of each coat, surface profile gauge for checking of surface profile in case of sand blasting. Holiday detectors and pinhole detectors for checking the painted surface discontinuities should be provided by the contractor.

The contractor shall make arrangements for paint manufacturer to provide expert technical service at site as and when required free of cost and without any obligation to the Owner, as it would be in the interest of the manufacturer to ensure that both surface preparation and application are carried out as per their recommendations.

Final inspection shall include measurement of paint dry film thickness, check of finish and workmanship.

8.2.0 Rub down and Touch Up of Primer

The shop coated surfaces shall be rubbed down thoroughly with emery paper to remove all dust, rust and other foreign matters, washed, degreased, then cleaned with warm fresh water and air dried.

The portions, from where the shop coat has peeled off, shall be touched up and allowed to dry before applying a coat of primer.

The compatibility between shop coat and field primer shall be ascertained from the paint manufacturer. In case degreasing with white spirit is not effective, the surface shall be finally wiped clean with aromatic solvent like xylol or light naphtha.

8.3.0 Non Compatible Shop Coat Primer

a) The compatibility of finishing coat shall be confirmed from the paint manufacturer. In the event of use of primer such as zinc rich epoxy, inorganic zinc silicate etc., the paint system shall depend on condition of shop coat. If the shop coat is in satisfactory condition showing no major defect, the shop coat shall not be removed. The touch up primer and finishing coat(s) shall be identified for application by Engineer. Shop coated (coated with primer & finishing coat) equipment shall not be repainted unless paint is damaged.

b) Shop primed equipment and surfaces shall only be 'spot cleaned' in damaged areas by means of power tool brush cleaning or hand tool cleaning and then spot primed before applying one coat of field primer unless otherwise specified. If shop primer is not compatible with field primer then shop coated primer shall be completely removed before application of selected paint system for particular environment. For package units/equipment, shop primer shall be as per the paint system given for particular environment.

c) In case of existing paint, compatibility between finishing coat and new selected finish coat shall be ascertained before application of finish coat. In case, the coat is selected for upgrading existing alkyd coating to high performance coating then, surface preparation shall be by manual/mechanical means to remove loose rust, peeled off/damaged paint, but sound old coating need not be removed. It shall be touched with suitable primer wherever it has peeled of before application of tie coat. The tie coat shall be applied after 7 days of curing of the primer. If, new paint system is not suitable to upgrade existing coating then complete paint shall be removed by mechanical or blast cleaning before application of new coating system.

8.4.0 Finish Paint

Suitable Finish paints as per the schedule shall be applied for the jobs. The color/shade shall be as approved by the Owner. After cleaning the dust on the dried up primer, first coat of finished paint shall be applied. After this first coat dries up hard, the surface is wet scrubbed cutting down to a smooth finish and ensuring that at no place the first coat is completely removed. After applying second coat, allowing the water to get evaporated completely, third finish coat of finish paint may be applied(if applicable).

9.0.0 STEEL STRUCTURES PAINTING

Generally, all steel structures shall receive two primer coats and two finish coats of painting. First coat of primer shall be given in shop after fabrication before dispatch to erection site after surface preparation as described below. The second coat of primer shall be applied (if required) after erection and final alignment of the erected structures. Two finish coats shall also be applied after erection.

Steel surface which is to painted shall be cleaned off dust and grease and the heavier layers of rust shall be removed by chipping to grade ST-2 as per SIS05-5900 or as per IS: 1477 (part -I) prior to actual surface preparation. Suitable primer of required DFT shall be applied as specified in the Paint system of this document- Annex-25.1.1.

Suitable finish paint of required DFT shall be applied as specified in the Paint system of this document- Annex-25.1.1. The undercoat and finish coat shall be of different tint to distinguish

the same from finish paint. All paints shall be of approved brand and shade as per the Owner's requirement.

Joints to be site welded shall have no paint applied within 100 mm of welding zone. Similarly where Friction grip fasteners are to be used no painting shall be provided. On completion of the joint the surfaces shall receive the paint as specified.

Surfaces inaccessible after assembly shall receive two coats of primer prior to assembly. Surfaces inaccessible after erection including top surfaces of floor beams supporting gratings or chequered plate shall receive one additional coat of finish paint over and above number of coats specified before erection. Portion of steel member embedded / to be encased in concrete shall not be painted.

10.0.0 PAINT MATERIALS

The paints shall conform to the specifications given in this Annex and class - 1 quality in the products range of any of the following manufacturers:

a. Asian Paints (India) Ltd.
b. Bombay Paints
c. Berger Paints India Ltd.,
d. Good lass Nerolac Paints Ltd.,
e. Garware Paints
f. Jenson & Nicholson
g. Shalimar Paints
h. Equivalent other country manufacturer after prior approval of Owner.

11.0.0 STORAGE

All paints and painting material shall be stored only in rooms to Engineer's approval. All necessary precautions shall be taken to prevent fire. The storage building shall preferably be separated from adjacent buildings. A signboard bearing the words "PAINT STORAGE - NO NAKED LIGHT - HIGHLY INFLAMMABLE - DANGER - NO SMOKING" shall be clearly displayed outside. All paints shall be stored in the safest manner so that no container rolls down and causes accidents. The shelf life of the paints shall be ensured so that the paint materials are not in storage and use after the date of expiry.

12.0.0 APPLICATION

Health and safety of work

The supplier has to check all painting work to be carried out according to the specification of the paint supplier further to all relevant prescriptions and regulations concerning the health and safety of work.

The paint supplier has to present a written specification including at least the flash point of the paints, ventilation requirements, handling precautions such as inhalation, eye and skin protection, and first aid procedure, storage requirements, spill or leak procedure, fire precaution, waste disposal.

Methods

Quality of the surface to be painted or coated has to be tested acc. to DIN 55928 and DIN 8202.

Temporary corrosion protections are to be completely removed prior to applying the definite one, in acc. with DIN 55928.

All prime coatings shall be applied by brush or airless spray or a combination of these methods, as approved by the coating manufacturer.

All doors, windows, stairways, handrails (if painted), bolts, flanges and equipment supports shall be finish painted by brush.
Spray guns should not be used outside in windy weather or near surfaces of a contrasting colour unless the latter is properly protected.

All cold-spray painting shall be done using standard equipment in accordance with accepted standards and methods.

Care has to be taken not to connect spraying devices for nitro and backelite paints simultaneously to oil based paints.

Paint applied to items that are not being painted shall be removed at the supplier's expense, leaving the surface clean, unstained and undamaged.

Dry film thickness (DFT)

To the maximum extent practicable the coats shall be applied as a continuous film of uniform thickness and free of pores. Overspray, skips, runs, sags and drips should be avoided. The different coats shall not be of the same colour.

For a composite paint or coating system consisting of several coats, the total DFT must be at least equal to the sum of the minimal DFT's for the individual coats. If, the paint system does not have the required minimum DFT those areas should be marked & repainted. If the occurrence of those areas is high, the complete surface must be repainted. It is also critically important to check the DFT of primers and intermediate coats and to correct them where necessary.

For paintings based on Zinc silicate the DFT is limited as well on minimum DFT as on maximum (150µm) because of the risk of mud cracking.

Consumption of paints

Has to be evaluated according to DIN 53220. The paints shall be tested as per
IS - 101.

Each coat of paint shall be allowed to harden before the next is applied. For epoxy paint the hardening time normally is 12-14 hours. Suppliers' recommendations regarding hardening time of epoxy paints must be followed.

Particular attention must be paid to full film thickness at edges.

The minimum total dry film thickness of the paint systems shall be as recommended in the **Annex 25.1.2**. The DFT is given in microns (millionths of a metre).

13.0.0 PROTECTIVE COATINGS AND PAINT SYSTEMS

The colour coding for identification of pipelines should comply with IS-2379 & IS -9404.

The type and number of protective coats for any item requiring painting are to be in accordance with DIN 55928 and are to be at least of a quality as shown in the attached Annex-25.1.1- Paint System.

Alternative to the Annex-25.1.1- Paint System specified, are to be presented on the schedule Departure from Specification, as indicated elsewhere.

Generally, all parts shall receive the specified prime coat (s) at the supplier's works to ensure that no corrosion occurs during transport to the site and storage at the site.

Parts which cannot be damaged during transport shall receive the full number of coats.

Types of Substrate, Base metal:

- Ferrous (Surface Temperature during operation < 120º C, EN ISO 12944:1998)

  To this group belongs carbon steel, low alloyed steel & high alloyed steel. All paint systems are inevitable for corrosion protection.

- Hot dip galvanized surfaces.

  Hot dip galvanized surfaces do require painting in a wet, industrial, chemicals and/or marine environment

- SS (EN ISO 12944:1998 conditionally applicable)

  In general, SS surfaces do not require painting unless in a chemical and/or marine environment. In case of chemical and/or marine environments determination of whether or not the surface requires painting depends on the chemical content of the base metal.

  The following formula applies:
  W = Cr + 3.3 x Mo + 22.45 N2

  If W < 23, then the surface has to be painted.

  If W < 28 & W > 23, then the surface to be painted if splash contact with the media (i.e. sea) is possible. This may also occur if there is a strong wind carrying drops to the surface.
  If W > 28, then the surface need not be painted.

- Aluminium

  By default such surfaces/components will not be painted. Exceptions are architectural/aesthetic reasons and high corrosive conditions, which shall be evaluated separately depending on aluminum alloys.

14.0.0 GALVANIZING

Galvanizing works shall conform in all respect to B.S. 729, B.S. 3083 and B.S.C.P. 2008 and to DIN 50976 whatever requires the higher quality and shall be performed by the hot dip process, unless otherwise specified.

It is essential that details of steel members and assemblies which are to be hot-dip galvanized should be designed in accordance with B.S 4479.

Vent-holes and drain-holes should be provided to avoid high internal pressures and air-locks during immersion, which may cause explosions, and to ensure that molten zinc is not retained in pockets during withdrawal.

Careful cleaning of welds is necessary before welded assemblies are dipped. The welds and the surrounding metal should be cleaned separately, preferably be blast-cleaning, because the usual preliminary pickling cannot be relied on to remove the welding slag.

All defects of the steel surface including cracks, surface laminations, laps and folds shall be removed in accordance with B.S. 4360. All drilling, cutting, welding, forming and final

fabrication of unit members and assemblies shall be completed, where feasible, before the structures are galvanized. The surface of the steelwork to be galvanized shall be free from paint, oil, grease and similar contaminants in accordance with DIN 55928, part 4 and DIN 50976. The weight of zinc coating per unit area has to be noted in the manufacturing documents in accordance with DIN 50976.

The minimum average coating weight shall be as specified in Table 1 of B.S. 729 or Table 2, DIN 50976, whatever requires higher quality.

Structural steel items shall be initially grit-blasted to B.S. 4232, second quality, (Sa 21/2) or by pickling in a bath and the minimum average coating weight on steel sections 5 mm thick and over shall be 610 g/m^2 (DFT = 85µ) .

On removal from the galvanizing bath, the resultant coating shall be smooth, continuous, free from gross surface imperfections such as bare spots, lumps, blisters and inclusions of flux, ash or dross.

Galvanized contact surfaces to be joined by high-tensile friction-grip bolts shall be roughened before assembly so that the required slip factor (defined in B.S. 3294, part 1 and B.S. 4604, part 1) is achieved. Care shall be taken to ensure that the roughening is confined to the area of the mating faces.

Bolts, nuts and washers, including general grade high-tensile friction grip bolts (referred to in B.S. 3139, and B.S.4395 part 1) shall be hot dip galvanized and subsequently centrifuged (according to B.S. 729). Nuts shall be tapped up to 0.4 mm oversize after galvanizing and the threads oiled to permit the nuts to be finger-turned on the bolt for the full depth of the nut. No lubricant, applied to the projecting threads of galvanized high-tensile friction-grip bolt after the bolt has been inserted through the steelwork, must be allowed to come into contact with the mating faces of the steelwork,. A local remelting of the galvanized parts to achieve the nuts to be finger turned on the bolt is possible in accordance with DIN 50976.

Protected slings must be used for offloading and erection. Galvanized work which is to be stored at the works or on site shall be stacked so as to provide adequate ventilation to all surfaces to avoid wet storage staining (white rust).

Small areas of the galvanized coating damaged in any way shall be restored in accordance with DIN 55928, part A and DIN 50976 by:

- Cleaning the area of any weld slag rust and other impurities and by thorough wire brushing to give a metallic clean surface.

- Application of suitable number of coats of zinc-rich paint containing more than 90 % w/w of zinc in dried film. The dry film thickness shall exceed at least 50 % the thickness of the desired galvanization. In case of application of a low melting point zinc alloy repair rod, the rods shall be in accordance with DIN1707, the thickness of the alloy shall be at least as of the desired galvanization.

The restored area is not to exceed 1 % of the galvanized surface.

Surface restoration of parts in contact with drinking water is not allowed and the quality of the galvanization is to be in accordance with DIN 2444.

After fixing, bolt heads, washers and nuts shall receive two coats of zinc-rich paint. Connections between galvanized surfaces and copper, copper alloy or aluminum surfaces shall be protected by suitable preferably hydrophobe tape wrappings to the owner's approval.

15.0.0 SPRAYED METAL COATINGS

Corrosion protection may be also achieved by spraying of suitable metals as zinc and/or aluminum on the surfaces of structures. For special cases tin, copper, lead can be used as well. Methods of surface preparation have to conform to B.S. 2569 or to DIN 8567. A proper treatment of the surface followed by an immediate spraying is to apply to ensure adhesion of the sprayed metal. The surface has to be clean, free of impurities, rust, mill scale and rough enough to have binding properties to ensure good enticulation with the sprayed layer. Suitable roughness can be achieved by blast cleaning acc. to BS 4232 or DIN 8567. Welds are to be cleaned and prepared with special care. All surfaces to be treated have to be dry and accessible.

Application of coatings, requirements for thickness, adhesion, composition of coating metals, and subsequent treatment have to conform to BS 2569, DIN 8565 and 8567.

Testing of the spray coated layers are to be carried out in accordance with DIN 8565.

The contractor has to specify the type, composition and thickness of the sprayed metal and of the sealing coating according to DIN 8565 including the corresponding warranties and tests if, sprayed metal coating will be applied.

Safety of work:

All precautions connected with this type of application of corrosion protection have to be in accordance with German regulation DVS 2307, page 1. 2.

Sprayed, unfused coating of metals and metallic compounds applied by combustion gas flame, plasma arc, detonation and similar processes, and the preparation of components, spraying techniques, sealing, finishing and inspection shall be according to B.S. 4761.

The hot galvanized surface has to be cleaned before the application of the coats to remove corrosion products, dirt, dust, grease.

The cleaning can be achieved by

- brush off
- washing with 1 - 1.5 % ammonia water with up to 0.1 % detergent added and followed by wet grinding to turn the foam to grey color,
- steam blasting.

16.0.0 WARNING NOTES / SIGNALS

This Instruction serves the identification of the coated surfaces that are received from shop in assembled condition / module wise.

The warning note shall prevent any possible damage to the coated surfaces during transportation / assembly at site.

Eg.: Welding work OR Heat treatment work on the outside of coated or lined surfaces is prohibited.

17.0.0 COLOUR CODE FOR PIPING

a. The colour code scheme is intended for identification of the individual group of the pipeline. The system of colour coding consists of a ground colour and colour bands superimposed on it. The colour coding for the identification of pipelines shall comply with **Annex – 25.1.1** of this specification.

Ground Colour shall be applied throughout the entire length for un insulated pipes. For insulated pipes, on the metal cladding or on the pipes of material such as non-ferrous metals, austenitic stainless steel etc., ground colour coating of minimum 2m length or of adequate length not to be mistaken as colour band shall be applied at places requiring colour bands. Colour band(s) shall be applied at the following location.

i. At battery limit points

ii. Intersection points & change of direction points in piping ways.

iii. Other points, such as midway of each piping way, near valves, junction joints of service appliances, walls, on either side of pipe culverts.

iv. For long stretch/yard piping at 50 M interval.

v. At start and terminating points.

b. Flow direction shall be indicated by an arrow in the location stated above and as directed by Engineer. Colors of arrows shall be black or white and in contrast to the color on which they are superimposed. The size of the arrows shall confirm to IS:2379. Product names shall be marked at pump inlet, outlet and battery limit in a suitable size as approved by Engineer. As a rule minimum width of color band shall conform to 75 mm up to 300 NB and to 100 mm over 350 NB. Whenever it is required by the Engineer to indicate that a pipeline carries a hazardous material, a hazard marking of diagonal stripes of red and golden yellow as per IS:2379 shall be painted on the ground color.

c. All uninsulated piping systems, hangers and supports shall have two coats of suitable primer coats and with suitable finish paints as per Annex 25.1.2 Painting system. Shades shall be as per IS 5 or as indicated by Owner /Engineer. Service of the pipe/line designations shall be painted on all pipes at visible locations.

18.0.0 IDENTIFICATION OF VESSELS, PIPING ETC.

Equipment number shall be stenciled in black or white on each vessel, column, equipment and machinery after painting.

Line number in black or white shall be stenciled on all the pipelines of more than one location as directed by Engineer; size of letters printed shall be 150 mm (high) for column & vessels. 50 mm (high) for pump compressor and other machinery and shall be as per IS: 9404 for piping. The storage tanks shall be marked as detailed in the respective drawing.

19.0.0 INSPECTION AND TESTING

a) All painting materials including primers and thinners brought to site for application shall be procured directly from manufacturer as per specifications and shall be accompanied by manufacturer's test certificates. Paint formulations without certificates are not acceptable. Engineer at his discretion, may call for tests for paint formulations. Contractor shall arrange to have such tests performed including batch wise test of wet paints for physical & chemical analysis. All costs thereof shall be borne by the contractor. The paints shall be tested as per IS: 101 / equivalent international standard and approved by the Owner.

b) The painting work shall be subject to inspection by Engineer at all times. In particular, following stage wise inspection shall be performed and contractor shall offer the work for inspection and approval of every stage before proceeding with the next stage. The record of inspection shall be maintained in the registers. Stages of inspection shall be surface preparation, primer application and each coat of paint. In addition to above, record shall include type of shop primer already applied on equipment e.g. red oxide zinc chromate or zinc phosphate or Silicate primer etc.

c) Any defect noticed during the various stages of inspection shall be rectified by the contractor to the entire satisfaction of Engineer before proceeding further. Irrespective of the inspection, repair and approval at intermediate stages of work, contractor shall be responsible for making good of any defects found during final inspection/guarantee period/defect liability period as defined in general condition of contract. Dry film thickness (DFT) shall be checked and recorded after application of each coat and extra coat of paint shall be applied to make-up the DFT specified without any extra coat to the Owner.

20.0.0 GUARANTEE

The contractor shall guarantee that the chemical and physical properties of paint materials used are in accordance with the specifications contained herein/to be provided during execution of work. The contractor shall produce test reports from the manufacturer regarding the quality of the particular batch of paint supplied. The Engineer shall have the right to test wet samples of paint at random for quality of the same. Batch test reports of the manufacturer's for each batch of paints supplied shall be made available by the contractor.

ANNEX-25.1.1

STANDARD FINAL COLOUR OF EQUIPMENT AND PIPING

1.0.0 STANDARD COLOUR CODE FOR MECHANICAL EQUIPMENT

Sl. No.	Description	Ground Colour
A	**CLOSED COOLING WATER SYSTEM**	
1	Closed cooling water pumps	Sea Green
2	Plate heat exchanger	Sea Green
3	Closed Cycle cooling Water (CCCW) pumps	Sea Green
4	CCCW Expansion tank	Sea Green
5	CCCW chemical dosing tank	Sea Green
B	**WATER TREATMENT PLANT**	
1	Raw water	
a	Raw water pump	Sea Green
b	Clarifier	Sea Green
c	- Raw / Fire water storage tank	Sea Green
d	DM plant supply pump	Sea Green
e	Filter air blower	Sea Green
f	Filter back wash pump	Sea Green
g	Lime slaking tank & agitator	Sea Green
h	Lime slurry transfer pump	Sea Green
I	Lime solution tank	Sea Green
j	Lime solution dosing pump	Sea Green
k	Alum solution tank	Sea Green
l	Alum solution metering pump	Sea Green
m	Polyelectrolyte solution tank	Sea Green
n	Polyelectrolyte solution metering pump	Sea Green
o	Sludge feed pump	Sea Green
p	Filter press	Sea Green
q	Service water tank for DM building	Sea Green
r	Service water tank for control annex	Sea Green
2	Demineralization system	
a	Activated carbon filter	Sea Green
b	Cation exchanger	Sea Green
c	Anion exchanger	Sea Green
d	Degasser tower	Sea Green
e	Air blower for degasser tower	Sea Green
f	Strong base anion exchanger	Sea Green
g	Degassed water transfer pump	Sea Green
h	Strong base anion exchanger	Sea Green
I	Mixed bed polisher	Sea Green
j	Air blower for mixed bed polisher	Sea Green
k	DM Water Storage tank	Sea Green
l	DM water transfer pump	Sea Green
m	Acid unloading cum transfer pump	Dark Admiralty Grey
n	Bulk acid storage tank	Dark Admiralty Grey
o	Acid measuring tank for SAC	Dark Admiralty Grey
p	Acid measuring tank for MB	Dark Admiralty Grey
q	Regeneration water pump	Dark Admiralty Grey
r	Caustic Lye unloading cum transfer pump	Dark Violet
s	Bulk caustic storage tank	Dark Violet
t	Caustic regeneration tank & agitator	Dark Violet

Sl. No.	Description	Ground Colour
u	Caustic solution filter	Dark Violet
v	Caustic dilution tank for SBA/WBA	Dark Violet
w	Caustic dilution tank for MB	Dark Violet
x	Caustic pump for regeneration for WBA/SBA	Dark Violet
y	Waste water recirculation cum disposal pump	Sea Green
C	**CRANE & HOIST**	
1	Power house EOT crane	Canary Yellow
2	CW pump house EOT crane	Canary Yellow
D	**COMPRESSED AIR PLANT**	
1	Air compressor	Sky Blue
2	Compressed air dryer	Sky Blue
3	Air receiver	Sky Blue
E	**Chemical Dosing**	
1	Hydrazine preparation tank	Dark Admiralty Grey
2	Ammonia preparation tank	Dark Admiralty Grey
3	Hydrazine & ammonia dosing tank	Dark Admiralty Grey
4	Hydrazine & ammonia dosing pump	Dark Admiralty Grey
5	Phosphate preparation tank	Dark Admiralty Grey
6	Phosphate dosing tank	Dark Admiralty Grey
7	Phosphate dosing pump	Dark Admiralty Grey
8	Sampling system	Dark Admiralty Grey
F	**FIRE PROTECTION SYSTEM**	
1	Diesel engine driven pump	Fire Red
2	Fuel tank for diesel engine driven pump	Fire Red
3	Main hydrant pump (Electrical)	Fire Red
4	Jockey pump	Fire Red
5	Fire Water Storage tank	Fire Red
6	CO2 cylinder	Fire Red
G	**FUEL OIL SYSTEM**	
1	Fuel oil pumps skid	Light Brown
2	Fuel oil Storage tank	Light Brown
3	Fuel oil strainer	Light Brown
H	**ASH DISPOSAL SYSTEM**	
1	Ash transmitting vessel	Aluminium
I	**AIR CONDITIONING AND VENTILATION SYSTEM**	
1	Refrigerant compressor	Sky Blue
2	Chilled / condenser pumps	Sea Green
3	Condenser water pipe	Sea Green
4	Fans	Grey

Notes:

1. This color code basically refers to IS:2379 for piping with necessary modifications
2. For any item left out, color coding will be decided after Owner's approval.

2.0.0 STANDARD COLOUR CODE FOR ELECTRICAL EQUIPMENT

	Description	Colour	Colour No.
1	Generator	Two undercoats of high quality epoxy based primer followed by two coats of epoxy painting	
2	Generator circuit breaker a) Outdoor	-	RAL 7032
	b) Indoor	Glossy white	-
3	Transformers	Pebble grey	RAL 7032
4	Bus ducts	Pebble grey	RAL 7032
5	Junction boxes.	Pebble grey	RAL 7032
6	HT/LT Switchboards, Distribution boards, Control & Relay panels		
	a) Indoor	Pebble grey	RAL 7032
	b) Outdoor	Pebble grey	RAL 7032
7	UPS Panel, charger panels	Pebble grey	RAL 7032
8	DG Alternator	Onan Green	-
9	NGR	Pebble grey	RAL 7032
10	Motor	Pebble grey	RAL 7032
11	Lighting fittings	As per manufacturer's standard	As per manufacturer's standard
12	Cable trays	Galvanized	
13	Elevator	Red oxide primer paint	

1. For interior coating, manufacturer's standard can be adopted subject to Owner's approval.
2. All panels that are to be erected at CCR floor shall be painted using RAL 7032 (exterior colour). All Electrical, C&I, Fire alarm or any other panel shall have this colour.

3.0.0 COLOUR CODING FOR IDENTIFICATION OF PIPELINES USED IN THERMAL POWER PLANTS

		Ground Shade		Band Shade		
Sl.No	Medium	Color	Color No. as per IS:5	Color	Color No. as per IS:5	Remarks
1	Water system					
a)	Untreated or raw / service	Sea green	217	White	-	White is not included in IS - 5-2007
b)	Treated/dematerialized	Sea green	217	Light orange	557	
c)	Condensate	Sea green	217	Light brown	410	
d)	Potable water	Sea green	217	French blue	166	
e)	RO water	Sea green	217	Light orange	557	
f)	Service & clarified water	Sea green	217	French blue	166	
2	Steam system					
a)	Auxiliary steam	Aluminum	-	Signal red	537	with aluminum
3	Air system					
a)	Instrument	Sky Blue	101	White	-	
b)	Service/Plant	Sky Blue	101	White	-	White not included in IS-5 - 2007
c)	Vacuum pipes	Sky Blue	101	Black	-	Black not included in
4	Gas system					
a)	Hydrogen	Canary yellow	309	Signal red	537	
b)	Chlorine	Canary yellow	309	Dark violet	796	
c)	Carbon dioxide	Canary yellow	309	Light grey	631	
d)	Oxygen	Canary yellow	309	White	218	White is not included in
5	Oils					

		Ground Shade		Band Shade		
Sl.No	Medium	Color	Color No. as per IS:5	Color	Color No. as per IS:5	Remarks
a)	LDO/HFO	Light brown	410	Brilliant green	221	
b)	Transformer oil	Light brown	410	Light orange	557	
6	Chemical feed					
a)	Acid piping (in water treatment plant)	Dark admiralty grey	632	Signal red	537	Hazard mark is given
b)	Alkali Piping (in water treatment plant)	Dark violet	796	Golden yellow	356	Hazard mark is given
7	Fire services	Fire red	536	-	-	-
8	Effluent pipes	Black	-	-	-	-

4.0.0 COLOUR CODE FOR STRUCTURAL STEEL

SL. NO	ITEAM/SERVICE	COLOR	COLOR No. as per IS:5
1	Gantry girder & monorail	Brilliant green	221
2	Gantry girder & monorail stopper	Signal red	537
3	Building structural steel columns brackets, beams bracings, roof truss, purloin, side grit, louvers, stringers	Dark admiralty grey	632
4	Pipe rack structure & trestle	Dark admiralty grey	632
5	Chequered plate (Plain Face)	Black	-
6	Grating	Black	-
7	Ladder	Dark admiralty grey	632
8	Hand railing Hand rail	Signal red	537
9	Middle rail	Signal red	537
10	Toe Plate	Signal red	537
11	Vertical post	Black	-
12	Structural steel for Silo	Smoke grey	692

Notes

1. Covering capacity and DFT depends on method of application. Covering capacity specified above is theoretical. Allowing the losses during application, min specified DFT shall be maintained.

2. All primers and finish coats shall be cold cured and air dried unless otherwise specified.

3. All paints shall conform to relevant Indian Standard and shall be applied in accordance with manufacturer's instructions for surface preparation, intervals, curing and application. The surface preparation, quality and workmanship shall be ensured.

4. Technical data sheets for all paints shall be supplied at the time of submission of quotations.

5. In case of use of epoxy tie coat, manufacturer shall demonstrate satisfactory test for inter coat adhesion. In case of limited availability of epoxy tie coat, alternate system may be used taking into consideration the service requirement of the system.

6. Contractor will submit the final colour shade for all equipments & piping under his scope for final approval by client / consultant.

ANNEX 25.1.2 PAINTING SYSTEMS						
Cleaning, Protective Coating and Painting - Systems designed as per ISO 12944 with service life of 10 yrs.						
Surface/ Location	**Temp**					
		Surface prep	**Coat**	**No. of coats**	**Generic Type**	**Dft/Coat**
Structural Steel work, piping (Oil + Water), tanks outside surface, transmission towers cranes, steel floors, galleries, stairways, Outdoor.	< 130 Deg	SA 2 1/2	Primer	1	Solvent based IZS - VS of 60%. Zn Dust - 1.77 kg/ltr minimum. Zn dust by weight - minimum 85%. Pot life 12 hrs / 21 Deg.- Paint to meet compositional & performance specifications for SSPC Paint 20 , Level 1	75
			Touch up	1	Two component Zinc rich Primer meeting performance and compositional specifications of SSPC Paint 20 Level2	(75)
			Mid coat	1	2 pack High build High Solid Lamellar MIO based Epoxy Mid coat.	200
			Finish	1	2 pack Acrylic Aliphatic Polyurethane top coat - with Gloss retention of at least 90% on QUVB exposure of minimum 1000 hrs.	75
					Total	**350**
Structural Steelwork, piping, indoor and outdoor	130 to 200 Deg	SA 2 1/2	Primer	1	Solvent based IZS - VS of 60%. Zn Dust - 1.77 kg/ltr minimum. Zn dust by weight - minimum 85%. Pot life 12 hrs / 21 Deg.- Paint to meet compositional & performance specifications for SSPC Paint 20 , Level 1.	75
			Touch up	1	Two component Zinc rich Primer meeting performance and compositional specifications of SSPC Paint 20 Level2	(75)
			Sealer	1	Single pack Heat Resistant Silicon Acrylic Finish paint.	25
			Finish	2	Single pack Heat Resistant Silicon Acrylic Finish paint.	25
					Total	**150**
Alternative -2		SA 2 1/2	Primer	1	Solvent based IZS - VS of 60%. Zn Dust - 1.77 kg/ltr minimum. Zn dust by weight - minimum 85%. Pot life 12 hrs / 21 Deg.- Paint to meet compositional & performance specifications for SSPC Paint 20 , Level 1.	75
				1	Single pack Moisture Cured, Inorganic Silicate based heat resisting finish up to 400 Deg - Grey shade./ white/ Aluminium.	50
			Finish	1		50
					Total	**175**
Alternative-3			Finish	1	Single pack Heat Resistant Silicon Acrylic Finish paint. - either Aviation White/ Aviation Orange.	80
					Total	**155**
Structural Steel work Piping, Un-insulated	200 to 400	SA 3	Primer	1	Solvent based IZS - VS of 60%. Zn Dust - 1.77 kg/ltr minimum. Zn dust by weight - minimum 85%. Pot life 12 hrs	75

ANNEX 25.1.2 PAINTING SYSTEMS						
Cleaning, Protective Coating and Painting - Systems designed as per ISO 12944 with service life of 10 yrs.						
Surface/ Location	**Temp**					
		Surface prep	**Coat**	**No. of coats**	**Generic Type**	**Dft/Coat**
Carbon Steel Indoor and Outdoor	Deg C.				/ 21 Deg.- Paint to meet compositional & performance specifications for SSPC Paint 20 , Level 1.	
			Touch up	1	Two component Zinc rich Primer meeting performance and compositional specifications of SSPC Paint 20 Level 2.	(75)
			Finish	2	Heat Resisting Silicon Aluminium Paint. VS to be min 28%.	20
					Total	**115**
Carbon steel surfaces subjected to temperature up to 400℃. But Under Thermal Insulation.	< 400℃	Power tool cleaning to St 2 /3		**2**	Red-oxide Zinc phosphate primer to IS 12744	**30**
						60
Components coming in the gas path (other than Coils), including water walls, SH panels, SH Headers, Hot air ducts etc.		Power tool cleaning		**2**	Red-oxide Zinc phosphate primer to IS 12744	**30**
						60
Structural Steel work, Piping (Oil + water) , Tanks Indoor.	<130 Deg.C	SA 3	Primer	1	Solvent based IZS - VS of 60%. Zn Dust - 1.77 kg/ltr minimum. Zn dust by weight - minimum 85%. Pot life 12 hrs / 21 Deg.- Paint to meet compositional & performance specifications for SSPC Paint 20 , Level 1.	75
			Touch up	1	Two component Zinc rich Primer meeting performance and compositional specifications of SSPC Paint 20 Level2	(75)
			Mid coat	2	2 pack High build High Solid Lamellar MIO based Epoxy Mid coat.	100
			Finish	2	Two component Polyamide Cured Epoxy Coating.	25
					Total	**325**
Structural Steel work in the battery rooms, chlorination plant and	Ambien t	SA 3	Primer	1	Solvent based IZS - VS of 60%. Zn Dust - 1.77 kg/ltr minimum. Zn dust by weight - minimum 85%. Pot life 12 hrs / 21 Deg.- Paint to meet compositional & performance	75

ANNEX 25.1.2 PAINTING SYSTEMS						
Cleaning, Protective Coating and Painting - Systems designed as per ISO 12944 with service life of 10 yrs.						
Surface/ Location	**Temp**					
		Surface prep	**Coat**	**No. of coats**	**Generic Type**	**Dft/Coat**
water treatment plant, (extremely aggressive atmosphere)					specifications for SSPC Paint 20 , Level 1	
			Touch up		Two component Zinc rich Primer meeting performance and compositional specifications of SSPC Paint 20 Level2	(75)
			Mid coat	1	Two component, high build rust encapsulating, aluminium pigmented modified epoxy coating.	125
			Finish	1	Two component High Build high Solid Aliphatic Amine Cured Epoxy coating. - Min VS 85%	150
					Total	**350**
Steel Tanks inside Surface (Total) for Oil Storage	Normal	SA 2.5	Primer	1	Two component high build amine cured epoxy Primer with zinc phosphate pigment.	75
			Finish	2	Two component Self priming High Build Polyamine adduct cured epoxy coating.	125
					Total	**325**
Alternative-1			Finish	3	Two component Self priming High Build Polyamine adduct cured epoxy coating. **(No primer required. Self priming coating post blasting)**	125
					Total	**375**
Alternative-2			Finish	2	Two component High build high solid Solvent free epoxy coating - certified by CFTRI for Potable water usage.**(Primer same as above)**	150
					Total	**300**
Steel Tanks inside Surface (Total) for Water Storage (Potable and Distilled Water)	Ambient	SA 3	Primer	1	Two component high build polyamide cured zinc phosphate Primer	75
			Finish	2	Two component Self priming High Build Polyamine adduct cured epoxy coating - certified by CFTRI for Potable water usage.	125
					Total	**325**
Alternative 1			Finish	2	Two component High build high solid Solvent free epoxy coating - certified by CFTRI for Potable water usage. **(No primer required. Self priming coating post blasting)**	200
					Total	**400**
Steelwork immersed in	< 60	SA 3	Primer	1	Two component High Build High Solid Rapid Curing Epoxy	75

ANNEX 25.1.2 PAINTING SYSTEMS						
Cleaning, Protective Coating and Painting - Systems designed as per ISO 12944 with service life of 10 yrs.						
Surface/ Location	**Temp**					
		Surface prep	**Coat**	**No. of coats**	**Generic Type**	**Dft/Coat**
seawater such as inlet/ outlet structures, dolphins, sheet piling	Deg C				Zinc Phosphate Primer.	
			Finish	1	Two component High build High Solid Modified Epoxy coating.	500
					Total	**575**
			Wherever TAR based product is not to be recommended.			
			Finish	1	Two component High build High Solid Modified Epoxy coating	500
					Total	**500**
			Finish	1	Two component High build High Solid Modified Epoxy coating with Glass Flake.	500
					Total	**500**
Alternative 1						
Cast Iron Water pipelines - Outside surface, buried in Soil	< 60 Deg C	SA 3	Primer	1	Solvent based IZS - VS of 60%. Zn Dust - 1.77 kg/ltr minimum. Zn dust by weight - minimum 85%. Pot life 12 hrs / 21 Deg.- Paint to meet compositional & performance specifications for SSPC Paint 20 , Level 1	75
			Finish	2	Polyamide Cured Coal Tar Epoxy, Vs min 65% black.	200
					Total	**475**
Alternate-1			Finish	1	Two component High build High Solid Modified Epoxy coating	500
Alternate -2			Finish	1	Two component High build High Solid Modified Epoxy coating with Glass Flake	500
Steel Pipes - Inside surfaces such as cooling water lines.	< 60 Deg C	SA 3	Primer	1	Solvent based IZS - VS of 60%. Zn Dust - 1.77 kg/ltr minimum. Zn dust by weight - minimum 85%. Pot life 12 hrs / 21 Deg.- Paint to meet compositional & performance specifications for SSPC Paint 20 , Level 1.	75
			Finish	2	Coal Tar Epoxy, Vs min 65% black.	225
					Total	**525**
Water Pipelines - Outside Surface, Indoor	< 60 Deg C	SA 3	Primer	1	Solvent based IZS - VS of 60%. Zn Dust - 1.77 kg/ltr minimum. Zn dust by weight - minimum 85%. Pot life 12 hrs / 21 Deg.- Paint to meet compositional & performance specifications for SSPC Paint 20 , Level 1.	75
			Touch	1	Two component Zinc rich Primer meeting performance and	(75)

ANNEX 25.1.2 PAINTING SYSTEMS						
Cleaning, Protective Coating and Painting - Systems designed as per ISO 12944 with service life of 10 yrs.						
Surface/ Location	**Temp**					
		Surface prep	**Coat**	**No. of coats**	**Generic Type**	**Dft/Coat**
			up		compositional specifications of SSPC Paint 20 Level2	
			Finish	2	Two component High Build high Solid Aliphatic Amine Cured Epoxy coating. - Min VS 85%	100
					Total	**275**
Oil pipelines - Outside surface, above ground	< 100 Deg C	SA 3	Primer	1	Solvent based IZS - VS of 60%. Zn Dust - 1.77 kg/ltr minimum. Zn dust by weight - minimum 85%. Pot life 12 hrs / 21 Deg.- Paint to meet compositional & performance specifications for SSPC Paint 20 , Level 1.	75
			Touch up		Two component Zinc rich Primer meeting performance and compositional specifications of SSPC Paint 20 Level2	(75)
			Mid coat	2	Two component High Build high Solid Aliphatic Amine Cured Epoxy coating. - Min VS 85%	100
			Finish	1	2 pack Acrylic Aliphatic Polyurethane top coat - with Gloss retention of at least 90% on QUVB exposure of minimum 1000 hrs.	75
					Total	**350**
Pumps, Motors, Turbine, Claddings, Steam Turbine Condenser, Indoor	Up to 90 Deg	SA 2.5	Primer	1	Catalysed Zn rich Primer with a VS of 60% min, complying to SSPC Paint 20 level 2.	75
			Finish	2	Two component High Build high Solid Aliphatic Amine Cured Epoxy coating. - Min VS 85%.	100
					Total	**275**
Alternative 1		SA 2.5	Primer	1	Catalysed Zn rich Primer with a VS of 60% min, complying to SSPC Paint 20 level 2.	75
			Mid coat	1	Two component High Build high Solid Aliphatic Amine Cured Epoxy coating. - Min VS 85%.	100
			Finish	2	2 pack Acrylic Aliphatic Polyurethane top coat - with Gloss retention of at least 90% on QUVB exposure of minimum 1000 hrs.	75
					Total	**250**
Heat Exchangers - Inside Surface.	Up to 60 Deg	SA 2.5	Primer	1	Solvent based IZS - VS of 60%. Zn Dust - 1.77 kg/ltr minimum. Zn dust by weight - minimum 85%. Pot life 12 hrs / 21 Deg.- Paint to meet compositional & performance specifications for SSPC Paint 20 , Level 1.	75
			Finish	2	Coal Tar Epoxy, Vs min 65% black.	200

ANNEX 25.1.2 PAINTING SYSTEMS						
Cleaning, Protective Coating and Painting - Systems designed as per ISO 12944 with service life of 10 yrs.						
Surface/ Location	**Temp**					
		Surface prep	**Coat**	**No. of coats**	**Generic Type**	**Dft/Coat**
					Total	**475**
Heat exchanger Coils coming in the gas path . (Eco, SH, RH coils & Loose tubes etc.)		Power tool cleaning			One coat of dip-coat paint -Red-oxide Zinc phosphate primer	35
Instrument panels, Electrical cubicles and similar steel sheet – indoor **(Can be used on Aluminium, steel, stainless steel and galvanized substrates.)**	Ambient	Oil grease and contamin atnts must be removed	Primer	1	Two pack , high build siloxane modified epoxy primer with zinc phosphate pigment.	75
			Mid coat	1	Two component High Build Surface Tolerant Epoxy coating pigmented with Aluminium and Lamellar Micaceous iron oxide	100
			Top coat	1	Two component High Build high Solid Aliphatic Amine Cured Epoxy coating. - Min VS 85%	100
					Total	**275**
Instrument panels, Electrical cubicles and similar steel sheet – outdoor **(Can be used on Aluminium, steel, stainless steel and galvanized substrates.)**	Ambient	Oil grease and contamin atnts must be removed	Primer	1	Two pack , high build siloxane modified epoxy primer with zinc phosphate pigment.	100
			Mid coat	1	Two component High Build Surface Tolerant Epoxy coating pigmented with Aluminium and Lamellar Micaceous iron oxide.	150
			Top coat	1	2 pack Acrylic Aliphatic Polyurethane top coat - with Gloss retention of atleast 90% on QUVB exposure of minimum 1000 hrs.	75
					Total	**325**
Substrate, base metal: Carbon steel, HDG acc ISO 1461 Or. Equiv. Non Insulated. - Outdoor	<120 Deg	Air blasting with Nonmetallic abrasive Powder	Touch up	1	Two component Zinc rich Primer meeting performance and compositional specifications of SSPC Paint 20 Level2	(75)
			Primer	1	Two pack , high build siloxane modified epoxy primer with zinc phosphate pigment.	50
			Mid coat	1	Two component High Build Surface Tolerant Epoxy coating pigmented with Aluminium and Lamellar Micaceous iron oxide	150

ANNEX 25.1.2 PAINTING SYSTEMS						
Cleaning, Protective Coating and Painting - Systems designed as per ISO 12944 with service life of 10 yrs.						
Surface/ Location	**Temp**					
		Surface prep	**Coat**	**No. of coats**	**Generic Type**	**Dft/Coat**
			Finish	1	2 pack Acrylic Aliphatic Polyurethane top coat - with Gloss retention of atleast 90% on QUVB exposure of minimum 1000 hrs.	75
					Total	**275**
Substrate, base metal: Carbon steel, HDG acc ISO 1461 Or. Equiv. Non Insulated.- Indoor	<120 Deg	Air blasting with Nonmetallic abrasive Powder	Touch up	1	Two component Zinc rich Primer meeting performance and compositional specifications of SSPC Paint 20 Level 2.	75
			Primer	1	Two pack , high build siloxane modified epoxy primer with zinc phosphate pigment.	125
			Finish	1	Two component High Build high Solid Aliphatic Amine Cured Epoxy coating. - Min VS 85%.	100
					Total	**225**
			For Outdoor Application			
			Touch up	1	Two component Zinc rich Primer meeting performance and compositional specifications of SSPC Paint 20 Level2	(75)
			Primer	1	Two pack , high build siloxane modified epoxy primer with zinc phosphate pigment.	125
			Finish	1	2 pack Acrylic Aliphatic Polyurethane top coat - with Gloss retention of at least 90% on QUVB exposure of minimum 1000 hrs.	75
					Total	**200**
			For Indoor Application			
Substrate, Stainless Steel - Non insulated.	< 120 Deg	Air blasting with Nonmetallic abrasive Powder	Primer	1	Two pack , high build siloxane modified epoxy primer with zinc phosphate pigment.	125
			Finish	1	Two component High Build high Solid Aliphatic Amine Cured Epoxy coating. - Min VS 85%	100
					Total	**225**
			For Outdoor Application			
			Primer	1	Two pack , high build siloxane modified epoxy primer with zinc phosphate pigment.	125
			Finish	1	2 pack Acrylic Aliphatic Polyurethane top coat - with Gloss retention of atleast 90% on QUVB exposure of minimum 1000 hrs.	75
					Total	**200**
Applicable for Water -				**For Indoor Application**		

ANNEX 25.1.2 PAINTING SYSTEMS						
Cleaning, Protective Coating and Painting - Systems designed as per ISO 12944 with service life of 10 yrs.						
Surface/ Location	**Temp**					
		Surface prep	**Coat**	**No. of coats**	**Generic Type**	**Dft/Coat**
Water Cooled heat Exchangers like Condensers, Flash box, Water - Water coolers etc. For Outdoor installations in corrosive atmosphere - like Chemical/ Marine.	< 120 Deg	Air blasting with Nonmetallic abrasive Powder	Primer	1	Two pack , high build siloxane modified epoxy primer with zinc phosphate pigment.	75
			Top coat	2	Two component High Build high Solid Aliphatic Amine Cured Epoxy coating. - Min VS 85%.	100
					Total	**275**
				For Outdoor Application		
			Primer	1	Two pack , high build siloxane modified epoxy primer with zinc phosphate pigment.	125
			Mid coat	1	Two component High Build high Solid Aliphatic Amine Cured Epoxy coating. - Min VS 85%.	100
			Top coat	1	2 pack Acrylic Aliphatic Polyurethane top coat - with Gloss retention of at least 90% on QUVB exposure of minimum 1000 hrs.	75
					Total	**300**

PAINTING SPECIFICATION FOR CIVIL BUILDINGS – COASTAL

S.No.	Location	Description
1	Metal and Timber Joinery	Two component high build, self priming, rust encapsulating, modified epoxy coating. Min VS 80%.
2	All Ceiling	Oil bound distemper (Office rooms) White Washing - all areas.
3	Internal wall surfaces	Oil Bound distemper
4	Control room/office	Acrylic Emulsion.
5	External faces of walls	Cement based Water proof paint
6	Walls of battery room and other acid/alkali spillage areas	1. Primer -1 coat of 50 microns - Two pack Polyamide Epoxy Primer with Zinc phosphate Pigment for concrete application. Min VS 48%. 2. Top coat - 1 coat of 125 microns - Two component self priming, high build polyamine adduct cured epoxy coating having excellent chemical resistance. Min VS 60%.
7	Cooling Tower External	
	a. Steel sections	i) Blasting to SA 2.5 ii) 1 x 75 microns - Inorganic Zinc Silicate as per SSPC Paint 20 Level 2. iii) 1 x 150 microns –Two components high build epoxy intermediate pigmented with lamellar micaceous iron oxide. Min VS 65%. iv) 1 x 75 microns - Two component high solids, Glossy, Acrylic Aliphatic Polyurethane paint, Min VS of 57%, Gloss retention of 90% after exposure to 2000 hrs under QUV B 313 lamp
	b. Concrete sections	1. 1 x 50 microns - Epoxy Polyamide Primer 2. 1x 500 microns-Two components high build high solid, engineered epoxy coating. Min VS 87%. - Typical dft - 500 microns per coat. Condensation as per IS 101 - 9000 hrs, Salt spray as per ASTM G 85 - 8000 hrs.
8	Chimney external	i) 1 x 50 microns Concrete Epoxy Polyamide primer followed by ii) 2 Coats of 50 microns of Acrylic Aliphatic Polyurethane paint

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

WS:UDAN: BLOWER: 441
Dt. 26-04-2022

Item Name	Indent No	Indent Dt.	Technical Specification/Drawing No
Degasser Blower with Motor & Acc.	RWT11086 & RWT11087	20.04.2022	ROS:6315/00 & ROS:4261/01

Project: Udangudi(2X660MW).

Following are Quality requirements:

1. All the items shall be inspected at Manufacturer works as per BHEL approved QP, Drawing, approved datasheet and relevant standard.
2. Bidder acceptance on our QP(DESAL:618/00,DT:26.04.2022). Any deviation on this QP shall be discussed with relevant standard/Plant Procedure and settled by Bidder before Placement of PO
3. Physical Inspection shall be done by BHEL/BHEL AIA at manufacturer works.
4. Packing of items shall be as per BHEL Engg approved packing drawing/ Datasheet/Specification or Packing procedure.
5. 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.
6. Annexure 'Q' shall be part of bidder's offer and shall be filled by bidder, duly signed and sealed.
7. Vendor Quality Plan shall contain following Inspection Notes:
    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 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. This QP shall be read along with relevant PO, BHEL Drawing and Approved Datasheet.

Bidder Sign & Seal

Ranipet	MANUFACTURER'S NAME AND ADDRESS M/S BHEL RANIPET/BHEL APPROVED VENDOR/ CUSTOMER APPROVED SOURCE	MANUFACTURING QUALITY PLAN ITEM: BLOWER (AS PER TECH SPEC-ROS:6315 & ROS:4261)	QP NO.: DESAL:618 REV. NO.: 00 DATE: 26.04.2022 PAGE: 01 OF 02.	PROJECT: AS PER PO. PACKAGE: WATER PACKAGE MAIN CONTRACTOR: M/S BHEL, RANIPET

Sl. No	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance Norms	Format of Record		Agency			Remarks
					M	C/N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			11.
1.0	**RAW MATERIAL INSPECTION**													
1.1	Casing, rotary lobe(rotor).end cover/end plate/ side plates	Mechanical	Major	Mechanical	1/HEAT		IS 210 / appd drg./data sheet		MTC	√	P	V	-	Corelated TC shall be furnished
1.2	Shaft	Mechanical & chemical	Major	Mechanical & chemical	1/HEAT		Material specification as per appd drg./ data sheet		MTC	√	P	V	-	
		Ndt	Major	Ut	100%		Astm a 388	Refer note-1	IR	√	P	V	-	For dia≥50mm
1.3	Gears	Mechanical & chemical	Major	Mechanical & chemical	1/HEAT		Material specification as per appd drg./ data sheet		MTC	√	P	V	-	
		Internal defects	Major	Ut	100%		Astm a388	Refer note-1	IR	√	P	V	-	For dia/thk≥50mm
		Hardness	Major	Mechanical	100%		Appd drg./data sheet		Report	√	P	V	-	
1.4	Motor	Refer separate MQP as applicable.												
2.0	**IN PROCESS INSPECTION**													
2.1	Impeller (lobe and shaft assy) after machining	Surface defects on machined area	Major	Dpt	100%	100%	ASTM E-165	No linear indications	IR	√	P	W	V	
		Dynamic balancing	Major	Balancing	100%	100%	ISO:1940 GR.6.3	Relevant Standard	Report	√	P	W	-	
2.2	Casing and end cover assembly	Pressure test	Major	Hydro test	100%	100%	1.5 times of design pressure or two times of working pressure whichever is higher.	No leakage	IR	√	P	W	-	Duration :30 minutes
3.0	**FINAL INSPECTION**													

LEGENDS:
* RECORD, IDENTIFIED WITH "TICK" (√) UNDER COLUMN 'D' SHALL BE SUBMITTED TO CUSTOMER AS A QA DOCUMENTATION PACKAGE. **M:** MANUFACTURER / SUB SUPPLIER, **C:** MAIN CONTRACTOR **N:** CUSTOMER/CONSULTANT **P:** PERFORM **W:** WITNESS, **V:** REVIEW OF RECORDS, **MA:** MAJOR AND **MI:** MINOR

	PREPARED BY	REVIEWD & APPROVED BY
MANUFACTURER	Rakesh Kr Madhu,(Dy Mgr/QA)	K Renjith (Mgr/QA)

Ranipet	MANUFACTURER'S NAME AND ADDRESS M/S BHEL RANIPET/BHEL APPROVED VENDOR/ CUSTOMER APPROVED SOURCE	MANUFACTURING QUALITY PLAN ITEM: BLOWER (AS PER TECH SPEC-ROS:6315 & ROS:4261)	QP NO.: DESAL:618 REV. NO.: 00 DATE: 26.04.2022 PAGE: 02 OF 02.	PROJECT: AS PER PO. PACKAGE: WATER PACKAGE MAIN CONTRACTOR: M/S BHEL, RANIPET

Sl. No	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance Norms	Format of Record		Agency			Remarks
					M	C/N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10.			11.
3.1	Complete blower assembly	Overall dimensions, completeness	Major	Visual and measure	100%	100%	Customer approved drawing		IR	√	P	W	-	
3.2		Performance test	Critical	Capacity, head, power,efficiency	100%	100%	Bs: 1571 part-ii / appd drg./ data sheet	Appd drg./ data sheet	IR	√	P	W	-	REFER NOTE-2
3.3		Noise & vibration	Critical	Measure	100%	100%	Appd drg./ data sheet / tech spec		IR	√	P	W	-	REFER NOTE-3
3.4		Bearing temp rise	Critical	Measure	100%	100%	Temperature rise should not be> 40°c over and above ambient temperature		IR	√	P	W	-	
3.5		Painting	Minor	Visual and measure	100%	-	Appd drg./ painting schedule / technical specification		IR	√	P	-	-	

NOTE-1: NORMAL PROBE 2MHZ-5MHZ, FREQUENCY SHALL BE USED. USING THIS PROBR, THE WALL ECHO (BWE) IN SOUND AREA SHALL BE SET 100% FULL SCREEN HEIGHT (FSH), A DEFECT ECHO OF>20% FSH IS NOT ACCEPTABLE. ALSO, LOSS OF BWE > 20% FSH IS NOT ACCEPTABLE.

NOTE-2: CALIBRATION STATUS OF THE EQUIPIMENT USED FOR PERFORMANCE TESTING SHALL BE VERIFIED DURING FINAL INSPECTION.

NOTE-3: NOSIE & VIBRATION SHALL BE RECORDED FOR REFERENCE ONLY. HOW EVER THE SAME SHALL BE GAURANTEED AT SITE,

NOTE-4: VARIOUS BOUGHT OUT ITEMS LIKE NRV, SPRING LOADED SAFETY/ RELIEF VALVE, PRESSURE HAUGE, V-BELT, BEARING, PULLEY, ETC. SHALL BE USED AS PER MANUFACTURER'S STANDARD PRACTICE.

	LEGENDS:		
	* RECORD, IDENTIFIED WITH "TICK" (√) UNDER COLUMN 'D' SHALL BE SUBMITTED TO CUSTOMER AS A QA DOCUMENTATION PACKAGE. **M:** MANUFACTURER / SUB SUPPLIER, **C:** MAIN CONTRACTOR **N:** CUSTOMER/CONSULTANT **P:** PERFORM **W:** WITNESS, **V:** REVIEW OF RECORDS, **MA:** MAJOR AND **MI:** MINOR	PREPARED BY	REVIEWD & APPROVED BY
MANUFACTURER		Rakesh Kr Madhu,(Dy Mgr/QA)	K Renjith (Mgr/QA)

Annexure Q

	Indent No: Enquiry no:	
Sl.No	**BHEL / Customer Requirements**	**## Specific confirmations by the manufacturer (Acceptable/Not acceptable)**
1	**Quality Plan Requirement: (If SQP is not given & Vendor QP applicable)**	
	(i) MQP (Manufacturing Quality Plan) shall be submitted in attached format for BHEL/Customer review & approval. Our SQP/Typical MQP/ MQP Format is attached for guidance & use.	
	(ii) MQP shall invariably cover w.r.t Inward inspection including on Raw material Procurement, In process and Final inspection in elaborated way/details.	
	(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.	
	(iv) No deviation on BHEL/Customer approved MQP/ SQP (In case BHEL SQP is provided) is acceptable.	
	(v) Bidder shall agree to submit all cross referred documents other than codes/standards to BHEL/Customer/Consultant.	
	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 standard. (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 standard.	
2	**Domestic / Inland Inspection** will be carried out by BHEL/BHEL appointed Third Party Inspection Agency (TPIA) / Customer/Customer Appointed Inspection Agency/Consultant. 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 Instrumentation Diagram / Process Flow Diagram / Single Line Diagram) etc. (as applicable).	
3	**Inspection Agency for Foreign Bidders and also for Indian Bidder but importing from Foreign Sources**: (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. However cost for such inspection agency shall be borne by the bidder only. Inspection charges for such inspection agency shall be indicated separately so that if BHEL/Customer is undertaking the inspection by on their own , then these charges are non claimable by the bidder. **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	BHEL / Customer Requirements	## Specific confirmations by the manufacturer (Acceptable/Not acceptable)
4	**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 (at least 2 weeks before) to TPI/Bidder's own inspection agency to avoid delay in the manufacturing processes.	
5	**Inspection before despatch for domestic supplier :** Inspection before despatch at supplier's works shall be carried out by BHEL appointed Inspection agency (as in Sl no. 2). Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet .	
6	**Inspection at Foreign Source/Supplier:** (a) As in sl no: 3. shall be ensured without fail (b) No material / items shall be despatched without getting the written communication from BHEL / Customer inspection carried out by Bidder appointed Third Party Inspection Agency (As per Sl no.3) / Customer/Customer Appointed Inspection Agency/Consultant. 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 Instrumentation Diagram / Process Flow Diagram / Single Line Diagram) etc. (As applicable). Inspection before despatch for Foreign supplier : Inspection before despatch at supplier's works shall be carried out by bidder appointed inspection agencies having international presence at vendors and or vendor's sub vendor works. Inspection shall be done as per approved Quality plan/ Technical specification/ Approved Drawing/ Approved Data sheet by TPIA mentioned in Sl no: 03 at supplier's cost.	
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 of 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 / Seaworthy Packing** shall be as per BHEL Packing schedule / approved drg / sketch. This shall be ensured to take care transit / handling / transhipment 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 with respect to 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.	
	VENDOR SIGN AND STAMP:	Vendor Name & Address:

PROJECT: UDANGUDI STPP STAGE I (2 X 660 MW) R678,R679,R4S9 & R4T0 CUSTOMER:TANGEDCO CONTRACTOR: BHEL - RANIPET	CONTRACT QUALITY REQUIREMENTS (CQR) for LT Motors UDANGUDI STPP STAGE I (2 X 660 MW) R678,R679,R4S9 & R4T0	DOC.NO:BAP/QR/ R4T0/LTM Rev NO.: 00 PAGE : Page 1 of 1 DATE :24 07 2021	##Enquiry No: ##Supplier Name: ##Offer reference: ##Date:

Sl. NO.	DESCRIPTION	BHEL Requirements	##Specific confirmations by the vendor
		ITEM: LT MOTORS	
01	**Type Test Requirements**	Vendor shall submit All the TYPE TEST requirement mentioned in Cl.2.12.1 of Spec. ROS:4261, REV: 01 for LT motors above 30 Kw. The above test to be carried out with in five years from the data of bid opening. These reports should be for the test conducted on the similar equipment to those proposed to be supplied under this enquiry and test(s) should have been either conducted at an independent laboratory (or) should have been witnessed by BHEL/BHELTPI/TANGEDCO/any other reputed customers/consultant like NTPC,EIL,TCE,DESIGN,DCPL Etc. In case bidder is not able to submit report of TYPE TESTS conducted in lasrt five years or in case TYPE TEST REPORTS are not found to be meeting the specification/relavant standard requirements, then all such test shall be conducted under this contract by the bidder without any commericail implications to BHEL, and reports shall be submitted for approval. No Charges shall be paid for testing under such circumstances. BHEL reserves the right to witness the testing for which due notice shall be given by the vendor.	
02	**Quality Plan Requirement**	Successful bidder should submit MQP which include various quality checks for LT Motor to BHEL/Customer TANGEDCO for review & approval.	
03	**Vendor approval**	Ultimate Customer approved vendors for LT motors only allowed and no deviation shall be taken on this specific requirement.	
04	**Packing**	Shall be as per Engg. Specification/Drawings so that any transit damage can be avoided.	
05	**Inspection**	1.BHEL or BHEL AIA Inspection is must before dispatch as per BHEL/Customer TANGEDCO approved MQP and approved Data sheet /drg/scheme/Spec. (As applicable) 2.No material shall be dispatched without BHEL/BHEL authorized inspection agency inspection 3. To raise inspection call by BHEL/BHEL AIA inspection including for type test witnessing , vendor is requested to contact 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 9443006303., Email id: zeeshan@bhel.in for inspection related activities for immediate response / resolution.	
06	**Motor Details**		
07	No deviation on the above is acceptable w.r.t. Quality requirements.		

S. No	Driven Equipment	LT Motor		
		Rating (in kW)	Quantity	Proposed Make
1				

Supplier signature with seal

Necessarily to be filled up by the vendor at the time of offer itself otherwise the offer may not be considered w.r.t Quality Requirements..

OPEN TENDER ENQUIRY CHECKLIST

SUPPLY OF DEGASSER BLOWER WITH MOTOR & ACCESSORIES AND ITS MANDATORY SPARES

AS PER TECH. SPEC. ROS: 6315, REV:00 & ROS:4261, REV:01 FOR 2 x 660 MW, Udangudi STPP

Enquiry No. 7720171E Dated 11-MAY-2022

Sl. No.	Document Name	Vendor Confirmation (Filled and Signed copy to be submitted along with Techno Commercial Offer)
01	**Annexure A** COVERING LETTER	Submitted ☐ Not Submitted ☐
02	**Annexure B** GENERAL TERMS & CONDITIONS (FOR GUIDANCE TO THE SUPPLIERS)	Submitted ☐ Not Submitted ☐
03	**Annexure C** COMMERCIAL TERMS AND CONDITIONS - INDIGENOUS	Submitted ☐ Not Submitted ☐
04	**Annexure L** Land Sharing countries GFR 2017 Rules amendment declaration form	Submitted ☐ Not Submitted ☐
05	**Annexure E** SPECIFICATION DEVIATION DISPOSITION REPORT	Submitted ☐ Not Submitted ☐
06	**Annexure F** UN PRICED /PRICE OFFER FORMAT	Submitted ☐ Not Submitted ☐
07	**Annexure G** Online SRF (optional)	Submitted ☐ Not Submitted ☐
08	**Annexure H** Make In India declaration Format	Submitted ☐ Not Submitted ☐
09	**Annexure I** PAYMENT MECHANISM	Submitted ☐ Not Submitted ☐
10	**Annexure K** PQR – FINANCIAL SOUNDNESS	Submitted ☐ Not Submitted ☐
11	**Technical PRE-QUALIFICATION REQUIREMENT – REF:- RWT11086 & RWT11087 dt 20.04.2022**	Submitted ☐ Not Submitted ☐
12	**TECHNICAL SPECIFICATION NO. SPEC. NO. 6315, REV:00 FOR DEGASSER BLOWER & ACCESSORIES & ROS:4261, REV:01 FOR LT MOTOR**	Submitted ☐ Not Submitted ☐
13	**Quality evaluation requirements and QP:DESAL:618/00,DT:26.04.2022 ANNEXURE – Q, INSPECTION CHECK LIST & CQR for LT Motors DOC.NO:BAP/QR/R4T0/LTM, DT:24.07.2021**	Submitted ☐ Not Submitted ☐

ANNEXURE - A
SUPPLY OF DEGASSER BLOWER WITH MOTOR & ACCESSORIES AND ITS MANDATORY SPARES
AS PER TECH. SPEC. ROS: 6315, REV:00 & ROS:4261, REV:01 FOR 2 x 660 MW, Udangudi STPP

Enquiry No. 7720171E Dated 11-MAY-2022

To All Bidders

Dear Sir,
Please submit your MOST COMPETITIVE quotation on FIRM PRICE basis, subject to our terms & conditions in the various annexures attached herein for the below listed materials so as to uploaded on or before the due date and time.

Requirement with Delivery date-FOR MAIN SUPPLY (FOR TANGEDCO Udangudi Site)

Itm Slno	Description	Qty	Unit	Delivery
1	RWT110860001 DEGASSER BLOWER WITH MOTOR & ACCESSORIES OF HEAD 0.01KG/CM2 & FLOW 792M3/HR AS PER TECH. SPECH. ROS:6315,REV:00	4	ST	Within 187 days from BHEL clearance

Requirement with Delivery date- for MANDATORY SPARES (FOR BHEL RANIPET STORES):

Itm Slno	Description	Qty	Unit	Delivery
2	RWT110870001 DRIVING END BEARING	1	ST	Within 187 days from BHEL clearance
3	RWT110870002 NON-DRIVING END BEARING	1	ST	
4	RWT110870003 MOTOR TERMINAL BLOCK UPTO 30 KW EACH RATING	10	ST	
5	RWT110870004 MOTOR OF EACH TYPE & RATING	1	ST	

All 05 Items will be compared on PACKAGE Basis & Order will be placed on a Single vendor who is the lowest (L1) on PACKAGE basis.

BIDDERS SHALL CAREFULLY READ THE FOLLOWING ANNEXURES / NOTES AND SHALL QUOTE THEIR BEST COMPETITIVE PRICE.

PLEASE REFER TO,

- ***01 Annexure A COVERING LETTER***
- ***02 Annexure B GENERAL TERMS & CONDITIONS (FOR GUIDANCE TO THE SUPPLIERS)***
- ***03 Annexure C COMMERCIAL TERMS AND CONDITIONS - INDIGENOUS***
- ***04 Annexure L Land Sharing countries GFR 2017 Rules amendment declaration form***
- ***05 Annexure E SPECIFICATION DEVIATION DISPOSITION REPORT***
- ***06 Annexure F UN PRICED /PRICE OFFER FORMAT***
- ***07 Annexure G Online SRF***
- ***08 Annexure H Make In India declaration Format***

09 Annexure I PAYMENT MECHANISM
10 Annexure K PQR – FINANCIAL SOUNDNESS

TECHNICAL ENCLOSURES AS PER FOLLOWINGS:

11 Technical PRE-QUALIFICATION REQUIREMENT – Technical PRE-QUALIFICATION REQUIREMENT – REF:- RWT11086 & RWT11087 dt 20.04.2022
12 TECHNICAL SPECIFICATION NO. TECHNICAL SPECIFICATION NO. SPEC. NO. 6315, REV:00 FOR DEGASSER BLOWER & ACCESSORIES & ROS:4261, REV:01 FOR LT MOTOR
13 Quality evaluation requirements and QP:DESAL:618/00,DT:26.04.2022 ANNEXURE – Q, INSPECTION CHECK LIST & CQR for LT Motors DOC.NO:BAP/QR/R4T0/LTM, DT:24.07.2021

Important Instruction to Bidders:

1. **All the items will be procured from a single vendor only & all the Items will be compared on PACKAGE Basis & Order will be placed on a Single vendor who is the lowest (L1) on package basis. Hence please quote for all the items including services. Incomplete offers will be rejected.**

2. **Vendors shall go through the "Pre-Qualification Requirement" & furnish Qualification Data sheet duly filled in along with Techno-Commercial offer. Offers received without this requirement will be summarily rejected & such offers will not be processed further.**

Name of the Project - 2X660 MW UDANGUDI STPP STAGE - I
Site Location - UDANGUDI, THOOTHUKUDI (DT) TAMILNADU - 628203

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 BHEL's e-procurement portal developed by NIC (*https://eprocurebhel.co.in/*) only.

In case of any difficulty faced while registering on ***BHEL's e-Procurement portal*** developed by NIC, queries may be addressed to 0120-4001002, 0120-4001005 and 0120-6277787; email: *support-eproc@nic.in* These details are also available on 'Contact Us' page of the portal.

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 login id and password to login to the portal. Enter your login id, password and click on Login button after Login, you need to select your digital signing and encryption certificates certificate.

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, not a mandatory one 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.

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 as mentioned in the commercial terms 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 time and date as mentioned in the enquiry document or subsequent corrigendum (if any). Part I will be opened on the scheduled day and time. Part II opening will be informed to techno-commercially qualified vendors.**

b) Price Bid opening will be done through e-mode / Reverse Auction method (English method) as mentioned in the enquiry commercial terms. 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

Note: The evaluation currency for this tender shall be INR.

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 offered 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 & 18.09.2020 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.

For this procurement, the local content to categorize a supplier as a Class I local supplier / Class II local supplier / Non-Local supplier and purchase preference to Class I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 04.06.2020 issued by DPIIT and subsequent amendments. In case of subsequent orders issued by the nodal ministry, changing the definition of local

content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT.

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

https://dpiit.gov.in/sites/default/files/PPP%20MII%20Order%20dated%2016%2009%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/Site 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: Refer commercial terms of enquiry. If not specified in commercial terms, then following will be followed.

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 non 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 may counter offer the L1 prices for full package to eligible MSE vendor who are within the +15% band of L1.

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

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

Items that are reserved for MSE and for any other items for which reservations for Indian manufacturers are notified by the Govt. Of India, such concessions as prevailing on the date of tender opening shall apply as a part of this tender conditions. ii) Foreign Suppliers "100% thru' irrevocable & unconfirmed LC at sight within 3 weeks from the PO date through any one of our Bankers listed elsewhere in the tender conditions for 100% value (less Agency Commission, if any) valid up to the PO delivery period and 15 days thereafter for negotiation. All bank charges in India to BHEL's account and all other charges outside India to Supplier's account. **BHEL would load the price of foreign suppliers in order to bring them on common platform as per Indigenous Suppliers on the account of differential payment terms to Indigenous Suppliers. Loading of payment terms will be "Base rate of State Bank of India (SBI) (as applicable on the date of bid opening: Techno-commercial bid opening in case of two part bids) + 6%, will be considered for loading for the periods of relaxation compared to indigenous suppliers i.e. 90 days.**

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

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

E] Liquidated Damages Clause:

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

F) Miscellaneous

i) Role of Principals and Agents:

BHEL will deal directly with indigenous manufacturers only.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

a) Manufacturer's Original Internal Inspection / Test certificate in triplicate.

b) Manufacturer's Original Guarantee certificate as per Purchase Order. The material shall be guaranteed for a period of 12 months from the date of acceptance of the materials at BHEL stores or 18 months from the date of dispatch whichever is earlier. The acceptance would be evidenced by the Stores Receipt Voucher (SRV) which will be raised by BHEL.

c) Inspection / Test Certificate issued by BHEL / Inspection agency specified in the Purchase Order. In the event that Inspection prior to dispatch is not carried out by the Engineers of BHEL, the Inspection certificate of the third party so authorized by BHEL and

d) Any other documentation as specified in the Purchase Order.

v) Conditions for transportation:

a) All shipping documents shall show the Purchase Order Number & Date, Import Licence Number & Date, and Letter of Credit Number & Date. b) 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 and will be specified in the enquiry commercial terms.

In case it is decided to go for RA, following may be referred to:-

> "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."

Bidders are advised to read the RA guidelines published in BHEL portal www.bhel.com.

https://www.bhel.com/sites/default/files/Guidelines%20for%20Reverse%20Auction%20-%202021%20-%20Abridged.pdf

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 instalment 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 submitted for a value of 2% of the Purchase order within 30 days from issue of PO. CEBG will be returned after submission of 10% PBG/BG.**

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.

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 submitted for a value of 10% of the Purchase order along with the first invoice.**

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 accepted 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)**:-

I. 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

II. 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.

III. Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

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: Avinash V Dy Manager / Purchase Department Address: Admin Building, First Floor, BHEL BAP Ranipet Tamil Nadu - 432406 Phone: 04172 284958 / 9629206425 Email: avinashv@bhel.in	Name: BP Choudhary Sr. Manager / Purchase Department Address: Admin Building, First Floor, BHEL BAP Ranipet Tamil Nadu - 432406 Phone: 04172 284474 / 9425604768 Email: bp.choudhary@bhel.in

Integrity Pact are applicable for all the BHEL enquiries whose estimated value is equal to or more than Rupees 02 Crores.

Format 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 enquiry Annexures applicable at the time of finalising the order against this tender.

-O-

ANNEXURE - C
BHEL : BAP : RANIPET
PURCHASE – WATER SYSTEM
COMMERCIAL TERMS AND CONDITIONS
SUPPLY OF DEGASSER BLOWER WITH MOTOR & ACCESSORIES AND ITS MANDATORY SPARES AS PER TECH. SPEC. ROS: 6315, REV:00 & ROS:4261, REV:01 FOR 2 X 660 MW, Udangudi STPP

Enquiry No. 7720171E Dated 11-MAY-2022

Sl. No.	DESCRIPTION	BHEL (PURCHASER) REQUIREMENT	VENDOR (SELLER) CONFIRMATION
I	**PRE-QUALIFICATION REQUIREMENT**		
1	PRE-QUALIFICATION REQUIREMENT (TECHNICAL)	Vendor should submit the Filled QR Datasheet & Necessary supporting documents proof for meeting the QR as per Pre-Qualification Requirement (PQR) for **DEGASSER BLOWER WITH MOTOR & ACCESSORIES** **1) Technical PRE-QUALIFICATION REQUIREMENT – REF:- RWT11086 & RWT11087 dt 20.04.2022**	
2	PRE-QUALIFICATION REQUIREMENT (FINANCIAL SOUNDNESS)	Vendor should submit the Filled QR Datasheet & Necessary supporting documents proof for meeting the QR as per Pre-Qualification Requirement (PQR) for FINANCIAL SOUNDNESS **1) ANNEXURE - K**	
3	FILLED Qualification Requirements DATA SHEET & NECESSARY SUPPORTING DOCUMENTS PROOF SUBMISSION	BHEL reserve the right to Accept/Reject the bids if any of the above details are not submitted - Please confirm	
II	**Technical**		
4	SCOPE OF SUPPLY	Please confirm the Scope of Supply of **"DEGASSER BLOWER WITH MOTOR & ACCESSORIES AND ITS MANDATORY SPARES AS PER TECH. SPEC. ROS: 6315, REV:00 & ROS:4261, REV:01 "** as per Specification No. **1. TECHNICAL SPECIFICATION NO. SPEC. NO. 6315, REV:00 FOR DEGASSER BLOWER & ACCESSORIES** **2. TECHNICAL SPECIFICATION NO.: ROS:4261,REV:01 FOR LT MOTOR** submit the same after necessary Filling,signing & returning a copy of the same.	
5	SPECIFICATION	Please confirm Clause wise / Point wise "IN TOTO" for all specifications and submit along with offer.	
6	DATA SHEETS / DRAWINGS	Filled Data Sheets and Drawings are to be submitted along with offer. (if applicable)	
7	QUALITY ASSURANCE PLAN (QAP)	Please Confirm to submit the QAP / RQP / MQP as per the Customer Sample Format for review and approval by customer within 2 Weeks from the date of Letter of Award (LOA). Please Refer Quality Requirements and provide your accepatnce on all pages with seal & Sign.	
8	SPECIFICATION DEVIATION DISPOSITION REPORT (SDDR)	Attached SDDR to be filled & submit along with offer. (Even, If NO deviation is taken, NIL report to be submitted).	
III	**Commercial Terms & Conditions**		
9	PRICE	Please confirm 'Firm Price' till completion of order. Price Variation not applicable.	
10	UNPRICED BID (PART-1)	Please confirm submission of '**Unpriced bid**' in the price bid format attached duly signed. SCANNED COPY of FILLED & SIGNED COPY OF 'Price Bid' format attached by filling all informations by writing '**Quoted**' as the case may be in the '**Rate**' and '**Value**' columns to be submitted through E-Procurement System.	
11	PRICED BID (PART-2)	Please confirm submission of '**Priced bid**' in the price bid format (BOQ) attached	
12	DELIVERY TERMS & PRICE BASIS	Please confirm for FOR - Destination basis. Unloading the Material at delivery location is in BHEL's Scope	

ANNEXURE - C
BHEL : BAP : RANIPET
PURCHASE – WATER SYSTEM
COMMERCIAL TERMS AND CONDITIONS
SUPPLY OF DEGASSER BLOWER WITH MOTOR & ACCESSORIES AND ITS MANDATORY SPARES AS PER TECH. SPEC. ROS: 6315, REV:00 & ROS:4261, REV:01 FOR 2 X 660 MW, Udangudi STPP

Enquiry No. 7720171E Dated 11-MAY-2022

Sl. No.	DESCRIPTION	BHEL (PURCHASER) REQUIREMENT	VENDOR (SELLER) CONFIRMATION
13	CONSIGNEE ADDRESS (SUPPLY DESTINATION) FOR ENQ. SL. NO. 1 (Main Supply)	Please confirm supply to the following consignee address in the event of Order. **SE/PROJECTS** **2X660 MW UDANGUDI STPP STAGE - I** **TAMILNADU GENERATION & DISTRIBUTION CORPORATION,** **UDANGUDI, THOOTHUKUDI (DT)** **TAMILNADU - 628203** **GSTIN : 33AADCT4784E1ZC** **Contact Person: will be informed later** **(On account of M/s BHEL, BAP, Ranipet - 632 406)**	
14	CONSIGNEE ADDRESS (SUPPLY DESTINATION) FOR ENQ. SL. NO. 002 to 005 (Mandatory Spares)	Please confirm supply to the following consignee address in the event of Order. **THE AGM / STORES** **BHARAT HEAVY ELECTRICALS LIMITED,** **BOILER AUXILIARIES PLANT,** **RANIPET – 632 406** **TAMILNADU.** **GSTIN 33AAACB4146P2ZL** **PAN NO. AAACB4146P**	
15	ORIGIN OF DESPATCH OF VARIOUS CONSIGNMENT	Please indicate clearly the origin of despatch of various consignments duly indicating whether interstate or intrastate based on the consignee address above. Origin of despatch should not be subjected to change during execution of contract.	City of Dispatch:_____ State of Dispatch:_____
16	PACKING & FORWARDING	Please confirm inclusion of Packing & Forwarding Charges in the Basic quoted price. If it is extra payable by BHEL, Please clearly indicate the applicable Packing & Forwarding charges in % value. Packing shall be in conformity with specifications and shall be such as to ensure prevention of damages, corrosion, deterioration, shortages, pilferage and loss in transit or storage. Packing List shall be submitted as per standard format along with advance set of documents for claiming payment which shall also indicate:- a) Packing size. b) Gross weight and net weight of each package. c) Contents of the package with quantity of each item separately.	
17	FREIGHT & INSURANCE	Please confirm inclusion of Freight & Insurance Charges towards this in the Basic quoted price. A) If Freight & GST is extra payable by BHEL, Please clearly indicate the applicable portions of : 01.Freight charges in % on Basic Quoted price. 02.If GST applicable for the freight kindly indicate the same. B) If Insurance is extra payable by BHEL, Please clearly indicate the applicable portions of : Insurance charges in % on Basic Quoted price. All dispatches shall be through road carriers approved by Purchaser/ Bank, on freight pre-paid basis. Road Permit/E-way bill, if required, will be arranged by Supplier.	

ANNEXURE - C
BHEL : BAP : RANIPET
PURCHASE – WATER SYSTEM
COMMERCIAL TERMS AND CONDITIONS
SUPPLY OF DEGASSER BLOWER WITH MOTOR & ACCESSORIES AND ITS MANDATORY SPARES AS PER TECH. SPEC. ROS: 6315, REV:00 & ROS:4261, REV:01 FOR 2 X 660 MW, Udangudi STPP

Enquiry No. 7720171E Dated 11-MAY-2022

Sl. No.	DESCRIPTION	BHEL (PURCHASER) REQUIREMENT	VENDOR (SELLER) CONFIRMATION
18	GOODS AND SERVICES TAX FOR **SUPPLY PORTION** (CGST/SGST/UTGST/IGST)	Seller/ Contractor is required to ensure that CGST/SGST/UTGST/IGST (whichever is applicable) is quoted as per the existing tariff on the date of the offer and all benefits as per existing laws have been considered. It is the responsibility of the seller/contractor to issue the Tax Invoice strictly as per the format prescribed under the relevant applicable GST law(CGST Act/SGST Act/UTGST Act/IGST Act). Vendor to indicate the proper GSTN Registration/ HSN code in their tax invoice. CGST/SGST/UTGST/IGST shall be paid at actuals against Tax Invoice but restricted to the amount and percentage in the order/contract	
		Please Confirm the Applicable percentage of CGST/SGST/UTGST/IGST Payable Extra by BHEL (OR) Not?	GST ____% GSTN Certificate to be submitted
19	PAYMENT TERM FOR Main SUPPLY	100% payment will be against site Receipt LR Copy & receipt of complete documents as per PO.	
20	PAYMENT TERM FOR Mandatory Spares SUPPLY	100% payment will be against Receipt of Material at Stores (DB i.e Day Book Register receipt) & receipt of complete documents as per PO.	
21	CONFIRM THE PAYMENT TERM FOR SUPPLY. (DURATION FOR MAKING PAYMENT)	Differential Payments applicable for Supply & Service - **Within 45 days for MSE (Micro & Small Enterprise) vendor &** **Within 90 days for MEDIUM & Non MSE vendors** **For MSE status Registration, you have to submit the Notarized copy of MSE Udyam Certificate with Original CA certificate.**	**Select Any one** **Micro or Small Bidder _____ (Submit Udyog Adhaar)** **Medium / Large Bidder _____**
22	UN-ACCEPTABLE PAYMENT TERMS	Offers with payment Terms such as Cash against Delivery / advance payment / payment through Bank against dispatch documents will be summarily rejected	
23	DELIVERY PERIOD FOR THE SUPPLY (ENQ. SL. NO. 001 MAIN ITEMS & ENQ. SL. NO.002 to 005 Mandatory Spares)	Please confirm the supply completion within 187 **days from the date of CAT-I Approval of all Documents / Manufacturing clearance, which ever is Later.** Vendor to submit all drawings/documents within 2 weeks from the date of purchase order and resubmit the drawings/documents within 1 week incorporating all the comments. In case there are supplier's delays in submission of drawings/documents beyond 2 weeks of order or 1 week of comments, that much days of delay would be reduced from delivery period. Vendor can also quote improved delivery date if any or otherwise, please clearly indicate the delivery period in weeks / months from the date of Manufacturing clearance.	
24	LIQUIDATED DAMAGES (LD) - Main Supply Portion	Purchaser reserves the right to recover from the Seller/ Contractor, as agreed liquidated damages and not by way of penalty, a sum equivalent to half (1/2) percent and applicable GST thereon, of the total contract price (main supply and E & C), excluding GST per week or part thereof, subject to a maximum of ten (10) percent of the total contract price (main supply and E&C) excluding GST, if E&C completion of the package is delayed beyond the contractual completion date or extension thereof as per the period stipulated in the Order/ Contract.	
25	OFFER VALIDITY	Please confirm Offer Validity for a minimum period of 120 days from the date of PART I bid opening.	

ANNEXURE - C
BHEL : BAP : RANIPET
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Enquiry No. 7720171E Dated 11-MAY-2022

Sl. No.	DESCRIPTION	BHEL (PURCHASER) REQUIREMENT	VENDOR (SELLER) CONFIRMATION
26	INSPECTION	Please confirm for 'Inspection of all the Items by BHEL Engineers / BHEL Authorized Engineer and Customer / Consultant Engineer either jointly or individually before the dispatch of the item at vendor works as per approved QAP. Inspection charges if any to be indicated in the price bid format.	
27	TEST CERTIFICATE (TC)	Please confirm that required TC will be provided at 'No Extra Cost'.	
28	GUARANTEE CERTIFICATE (GC) - Supply Portion.	Please confirm furnishing of Guarantee certificate in BHEL format for 12 months from the date of receipt of materials at BHEL stores.	
29	REVERSE AUCTION	Not Applicable	
30	RISK PURCHASE CLAUSE	Alternatively, the purchaser at his option will be entitled the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or despatch within the time stipulated as aforesaid or If the same were not available, the best and the nearest available substitute therefor. The supplier shall be liable for any loss which the purchaser may sustain by reason of such risk purchases In addition to penality at the rate mentioned In LD Clause above.	
31	ZERO DATE (CONTRACT EFFECTIVE DATE)	Contract Effective date starts from Manufacturing Clearance subject to Documents submission clause. Please confirm for 'Date of Manufacturing Clearance'.	
32	Loading Criteria	Please note that no Commercial deviation is acceptable to BHEL. In case any deviation is taken in any of the commercial terms such as PAYMENT TERMS, LD etc., where in we have specified the days, percentages etc., then loading will be done to the extent of the short fall with respect to the upper Limit specified for evaluation. In repect of LD offers which do not accept for LD Clause would be summerly rejected - Please Confirm.	
33	NEGOTATION	In the event of negotiation if any, please confirm participation only by supplier's representative and not by their Agent which include indian Agent in the case of Foreign Offer.	
34	LAW GOVERNING THE CONTRACT AND COURT JURISDICTION	The contract shall be governed by the Law for the time being in force in the Republic of India. The Civil Court having original Civil Jurisdiction at Ranipet / Vellore Tamil Nadu, shall alone have exclusive jurisdiction in regard to all matters in respect of the Contract.	
35	FRAUD 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	
36	PLEASE PROVIDE THE STATUTORY DETAILS (Submit a copy of PAN, if not submitted already)	GST Regn. Number	
		HSN NO.: HARMONIZED SYSTEM OF NOMENCLATURE UNDER GST FOR THE OFFERED ITEM	
		PAN No. :	
37	CONTACT PERSON'S ON **TECHNICAL DETAILS** FOR CORRESPONDENCE	Name:	
		Designation:	
		Phone No.:	
		Mobile No.:	
		Fax No.:	

ANNEXURE - C
BHEL : BAP : RANIPET
PURCHASE – WATER SYSTEM
COMMERCIAL TERMS AND CONDITIONS
SUPPLY OF DEGASSER BLOWER WITH MOTOR & ACCESSORIES AND ITS MANDATORY SPARES AS PER TECH. SPEC. ROS: 6315, REV:00 & ROS:4261, REV:01 FOR 2 X 660 MW, Udangudi STPP

Enquiry No. 7720171E Dated 11-MAY-2022

Sl. No.	DESCRIPTION	BHEL (PURCHASER) REQUIREMENT	VENDOR (SELLER) CONFIRMATION
		E-mail ID:	
38	CONTACT PERSON'S ON **COMMERCIAL DETAILS** FOR CORRESPONDENCE	Name:	
		Designation:	
		Phone No.:	
		Mobile No.:	
		Fax No.:	
		E-mail ID:	
39	GeM Registration	GeM vendor ID is mandatory for all tenders above Rs 25 Lakhs	GeM Seller ID _____
40	**BHEL will not take cognizance of commercial terms mentioned by the bidder any where else.** **Commercial terms and conditions indicated in this Annexure - C will only be applicable and binding.**	**Acceptance Required**	

Signature, Seal & Date of offerer on all the pages.

To be submitted in company letter head

ANNEXURE L

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

1. Any of entity/office/workshop of our 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 our 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 our 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 our 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.

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.

To be submitted in company letter head

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_____

ANNEXURE - E
TECH SPECIFICATION AND COMMERCIAL TERMS DEVIATION DISPOSITION REPORT

Enquiry No. 7720171E Dated 11-MAY-2022	SUPPLY OF DEGASSER BLOWER WITH MOTOR & ACCESSORIES AND ITS MANDATORY SPARES AS PER TECH. SPEC. ROS: 6315, REV:00 & ROS:4261, REV:01 FOR 2 x 660 MW, Udangudi STPP	Vendor Name

01.TECHNICAL SPECIFICATION NO. SPEC. NO. 6315, REV:00 FOR DEGASSER BLOWER & ACCESSORIES & ROS:4261,REV:01 FOR LT MOTOR

02. Quality evaluation requirements:QP:DESAL:618/00,DT:26.04.2022 ANNEXURE – Q, INSPECTION CHECK LIST & CQR for LT Motors DOC.NO:BAP/QR/R4T0/LTM, DT:24.07.2021

03. Commercial Terms & Conditions as per Annexure C

4. Financial PQR - Annexure K

Page	Clause	Details Of Deviation With Reason	Disposition By BHEL
Signature Of Vendor			Reviewed By
" AGREED DEVIATION "			APPROVED BY
if any to be incorporated in the PO in the event of order.			

Date :

VENDOR's SIGNATURE WITH SEAL

Validate | Print | Help

Item Wise BoQ

Tender Inviting Authority: DEPUTY MANAGER/PURCHASE

Name of Work:DEGASSER BLOWER WITH MOTOR & ACCESSORIES AND ITS MANDATORY SPARES

Contract No: 7720XXXE / XX.05.2022

Name of the Bidder/ Bidding Firm / Company :	

PRICE SCHEDULE

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)

NUMBER #	TEXT #	TEXT #	NUMBER #	TEXT #	NUMBER #	NUMBER	NUMBER #	NUMBER #	TEXT #
Sl. No.	Item Description	Item Code / Make	Quantity	Units	BASIC RATE PER UNIT(Inclusive of packing & forwarding, freight and insurance) to be entered by the Bidder in INR Rs. P	GST on Basic price to be entered by the Bidder in percentage	TOTAL AMOUNT Without Taxes in Rs. P	TOTAL AMOUNT With Taxes in Rs. P	TOTAL AMOUNT In Words
1	2	3	4	5	13	14	53	54	55
0	DEGASSER BLOWER WITH MOTOR & ACCESSORIES AND ITS MANDATORY SPARES								
1	DEGASSER BLOWER WITH MOTOR & ACCESSORIES OF HEAD 0.01KG/CM2 & FLOW 792M3/HR AS PER TECH. SPECH. ROS:6315,REV:00	RWT110860001	4	ST		18.00	0.00	0.00	INR Zero Only
2	DRIVING END BEARING	RWT110870001	1	ST		18.00	0.00	0.00	INR Zero Only
3	NON-DRIVING END BEARING	RWT110870002	1	ST		18.00	0.00	0.00	INR Zero Only
4	MOTOR TERMINAL BLOCK UPTO 30 KW EACH RATING	RWT110870003	10	ST		18.00	0.00	0.00	INR Zero Only
5	MOTOR OF EACH TYPE & RATING	RWT110870004	1	ST		18.00	0.00	0.00	INR Zero Only
Total in Figures							0.00	0.00	INR Zero Only
Quoted Rate in Words		INR Zero Only							

ANNEXURE G

Online SRF Submission Procedure

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

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

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

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

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

Or else, type directly as http://203.129.195.108

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

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

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

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

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

Annexure H

(On company letter head)

Self-Certification under Preference to "MAKE IN INDIA" Policy

CERTIFICATE

In line with Government Public Procurement Order No. P-45021/2/2017-BE-II dt. 15.06.2017, as amended from time to time and as applicable on the date of submission of tender, we hereby certify that we M/s_____ (supplier name) are local supplier
meeting the requirement of minimum Local content as defined in above orders for the material / package against BHEL's Enquiry No. **7720074E Dated 21-APR-2022**

Please select one category from below
☐ Class I supplier – (Local content more than 50%)
☐ Class II Supplier – (Local Content >20& <=50%)
☐ Non-Local Supplier – (Local Content less than 20%)

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

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

Seal and Signature of Authorized Signatory

*For tenders with value more than INR 10 Crore, above declaration to accompanied by a certificate from a CA. please refer GOI's MII order P-45021/2/2017-BE-II dt. 15.06.2017 latest revision dt 16.09.2020.

ANNEXURE I

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 supplier 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.

Annexure K

PRE-QUALIFICATION REQUIREMENT (QR)
FINANCIAL SOUNDNESS

Sl. No.	BHEL REQUIREMENT	VENDOR (SELLER) CONFIRMATION
1	The bidder has to submit financial accounts (audited, if applicable comprising of Audit report, Balance Sheet, Profit & Loss A/c Statement and Notes/Schedules pertaining to Turnover/Sales/Revenue), for last three years (or from the date of incorporation, whichever is less) as on tender due date to review the above criteria. In case the incorporation of vendor is less than 3 years, average annual financial turnover shall be calculated based on available information as below:-	
2	Average annual financial turnover during the last Three Financial Years ending 31.03.2021 should not be less than Rs 1,00,000/- (Rs One Lakh)	

Signature, Seal & Date of Bidder

Ref :INSP:CHK:001/ REV 00
DT:10/08/2020

Inspection document Check List

Inspection documents to be submitted after inspection of the items for getting dispatch clearance. Vendor shall provide documents to the BHEL/BHEL TPIA inspector during inspection and TPIA shall sign all the documents.

The document dossier shall contain following.

SL no.	Documents
1	Unpriced PO COPY.
2	Latest approved specification, datasheet, drawing, P&ID, test procedures, approved painting schedule, Packing etc.
3	Approved QAP.
4	CQIR Report (Disposal code should be Accepted all the offered QTY)
5	As per approved QAP all the inspection documents to be submitted. **Indexing of the reports as per QAP and each page wise numbered and correlated to QAP.** **If more than one test in each page, against each test the clause number of QAP to be mentioned.** Inspection clause shall be mentioned against each test. 1. Raw Material Test Certificates (NABL approved Lab TC/Manufacturer TC like Mechanical properties, Chemical Properties, UT etc. as per approved QAP.

K. Kovar

கோ. கோவர்தனன்
கே. கோவர்தனன் / K. KOVARTHANAN
வரிஷ்ட இஞ்சினியர் / Sr. Engineer
தரக்கட்டுப்பாடு / Quality Department
பி.எச்.இ.எல் / BHEL RAP RANIPET-6

	2. In process Inspection Reports like Hydro test, Dimension Report, MPI,UT ,Balancing etc. as per approved QAP. 3. Final Inspection Reports like Shop Assembly with testing reports, Hydro test/Leak / Pressure test reports, Type test Reports, WPS/PQR/WPQ Reports, PT/RT/UT/MT Reports etc. as per approved QAP. 4. Final Inspection like packing and surface preparation & Painting/Metal finishing reports. (Sea worthy packing / Special Packing requirement).
6	Relevant pages of standard shall be attached with report.
7	Calibration reports of the instruments used to be signed by TPI after verification.
8	Above said documents are should be in single .pdf file with not more than 10MB (if more than 10MB can be split into multiple files)
9	Hard copy of the same to be submitted along with material dispatch.

K KOVARTHANAN

DM/QC PROC

BHEL RANIPET

கா. மகாவர்த்தனன்
க. கோவர்தனன் / K. KOVARTHANAN
वरिष्ठ इंजीनियर / Sr. Engineer
गुणवत्ता विभाग / Quality Department
बीएचईएल बीएपी, रानीपेट / BHEL BAP, RANIPET