



BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE
Trichy - 620 014, India

Ref: ENSFV00233

Product: HP TURBINE BYPASS SYSTEM – PATRATU 3 x 800 MW

Pre-Qualification Criteria

The Bidder is required to meet the provenness criteria and / or qualification requirement for HP turbine Bypass system as per criteria below:

1.1 HP Bypass system offered by the Bidder shall be a manufacturer who has previously designed (either by itself or under collaboration / licensing agreement), manufactured / got manufactured the respective equipment(s) of the type and minimum equipment rating 750 Ton/hr such that the respective equipment(s) are in successful operation in at least one (1) plant for a period not less than one (1) year. Capacity of each valve supplied should not be less than 750 Ton/hr at rated steam parameters as mentioned in technical specification.

1.2 In case the Bidder is not a manufacturer of proven equipment(s) as per clause 1.1 above but is a manufacturer for such equipment(s), for units of at least 500 MW rating, the Bidder can manufacture such equipment(s) for 800 MW supercritical units also, provided it has collaboration or valid licensing agreement for design, engineering, manufacturing, supply of such equipment(s) in India with such manufacturer(s) who meet the requirements stipulated at clause 1.1 above for the respective equipment(s).

1.3 A JV / Subsidiary Company formed for manufacturing and supply of equipment(s) as listed at clause no. 1.1 above in India can also manufacture such equipment, provided that it has a valid collaboration or licensing agreement for design, engineering, manufacturing of such equipment(s) in India with a qualified equipment manufacturer who meets the requirements stipulated at clause 1.1 above (or the technology provider of the qualified equipment manufacturer). Further, in such a case, such qualified equipment manufacturers should have, directly or indirectly through its holding company/ subsidiary company, at least 26% equity participation in the Indian Joint Venture Company/ Subsidiary Company, which shall be maintained for a lock-in period of seven (7) years from the date of incorporation of such Joint Venture/ Subsidiary or up to the end of defect liability period of the contract, whichever is later. In addition, bidder shall be required to furnish a letter of support from Collaborator/Licenser/Technology provider for successful performance of respective equipment valid for a period of 7 years or up to end of defect liability period of the contract whichever is later at the time of placement of order.

1.4 Before taking up the manufacturing of such equipment(s) as per clause 1.2 and 1.3 above, the Bidder must create (or should have created) manufacturing and testing facilities at its works as per Collaborator / licenser's design, manufacturing and quality control system for such equipment duly certified by the Collaborator / licenser.



BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE
Trichy - 620 014, India

Ref: ENSFV00233

Further, the Collaborator / Licensor shall provide (or should have provided) all design, design calculation, manufacturing drawings and must provide (or should have provided) technical and quality surveillance assistance and supervision during manufacturing, erection, testing, commissioning of equipment.

1.5 Bidder shall offer and supply only the type of the above equipment(s) for which it, Collaborator(s) / Licensor(s) proposed by the Bidder for the above equipment(s) is qualified.

1.6 The Owner (NTPC) reserves the right to fully satisfy himself regarding capability and capacity of Bidder and the proposed arrangement and may prescribe additional requirement before allowing manufacture of the equipment listed above for this contract.

1.7 End-customer (NTPC) approval is applicable for this project. The submitted documents will be evaluated by the end-customer for approval of the bidder. Part-II (price) bids of the bidders who are NOT approved by the end-customer will NOT be considered.



BHEL – Tiruchirappalli – 620014,
India

Valves Engineering and R&D

PURCHASE SPECIFICATION

DOC No: **SPEC:HP:0072** Rev: **00**

Effective Date: 06-06-2020

Page: **1** of **21**

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

Revision Record:

Rev. No	Date	Details of Revision
00	06 June 2020	First Release

Contents

1. GENERAL	2
2. APPLICATION	2
3. SCOPE	2
4. DESIGN AND CONSTRUCTION	3
4.1 GENERAL	3
4.2 STEAM AND WATER VALVES	6
4.3 INSTRUMENTS IN OIL SYSTEM	7
4.4 C&I REQUIREMENTS	7
4.5 MOTORS	14
4.6 ADDITIONAL SCOPE (LOOSE SUPPLY)	15
5 INSPECTION & TESTING	16
6 ADDITIONAL REQUIREMENTS	17
7 DOCUMENT REQUIREMENTS	17
8 SELECTION DATA FOR H.P. BYPASS VALVES	20
9 SUPERVISION DURING ERECTION-COMMISSIONING & TRAINING AT SITE	20
10 BREAK UP FOR SUPPLY OF HP BYPASS VALVES AND HYDRAULIC SYSTEM	21

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

1. GENERAL

This specification, together with the data sheet attached herewith covers the requirements for the design, materials, construction details, manufacture, name plate marking, inspection, and testing of HP Bypass valves and hydraulic system. The offer shall be submitted along with all the documents mentioned in this specification.

- 1.1. Data sheet indicates the selection parameters of the HP Bypass valves, actuators, and associated hydraulic system components. However, bidder shall be responsible for sizing and selection of proper valve and hydraulic actuator meeting the indicated operating and design conditions.
- 1.2. The design, material, construction, manufacture, inspection and testing of valves shall conform to the latest applicable codes and standards.
- 1.3. The valves covered under this specification shall be governed by the following standards. However, the valves conforming to other International Standards may be acceptable, provided they are equivalent or superior to those listed below:
 - ANSI-American National Standards Institute
 - ASME-American Society of Mechanical Engineers
 - ASTM -American Society for Testing and Materials.
 - AWS-American Welding Society
 - ISA-Instrument Society of America
 - IBR – Indian Boiler Regulations
 - OSHA-Occupational Safety and Health Administration
 - DIN-Deutsche Industrie Norm
 - IS – Indian Standards
 - IEC - The International Electrotechnical Commission
- 1.4. All materials, construction and design of the pressure parts shall conform in all respects to the applicable standards.
- 1.5. All materials shall be readily identifiable. Mill test reports shall be provided for all pressure boundary parts. These test reports shall be available for review at the Bidder's shops. Copies of these are to be submitted to BHEL.
- 1.6. Nothing in this Specification shall be construed as relieving the Bidder of his responsibility for compliance with all applicable codes and regulations.

The Maximum temperature recorded at the project location is 50 °C

The Minimum temperature recorded at the project location is 6 °C

2. APPLICATION

The bypass system would work in parallel with Turbine during load rejection in a coordinated manner with steam generator. However, during start-up of Boiler, to build matching steam parameters required for turbine and also during load transfer to turbine, the bypass system would function in a non-coordinated manner as per the operator demand. The bypass system in all cases establishes a parallel path of HP and IP/LP turbine through re-heater, which would enable the boiler to maintain the steam parameters ahead of HP and IP control valve as governed by Turbine requirement.

3. SCOPE

For each 800 MW unit, scope of supply shall include HP Bypass steam control valves (2), Spray water isolation (1) and spray water control valves (2), electro-hydraulic actuators for the above valves and

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

final control elements (proportional valves) and associated hydraulic power unit (HPU), stainless steel piping connecting the HPU and actuators, connecting fittings, filters, hoses, additional accumulators, fast opening device, and all accessories required to make the HP Bypass system complete in all respects.

All accessories, including but not limited to, steam blowing device, flushing device for oil pipeline flushing, filling and gauging device for accumulators, etc., required for initial commissioning and ensuring continuous commercial operation shall also be in vendor's scope of supply.

From BHEL DCS, command of 4-20mA will be available to the vendor's equipment. Vendor shall be responsible for positioning the valves as per BHEL DCS's command. All the necessary equipment lie in the scope of the vendor.

Additional scope (loose supply) as indicated under Clause 4.6.

Clause 10 shall be referred for breakup of supply.

BHEL reserves the right to order any or all of the components / equipment included in the scope of supply.

4. DESIGN AND CONSTRUCTION

4.1 GENERAL

- 4.1.1 Seat tightness of the HP bypass valves shall be equivalent to block valve tightness conforming to MSS SP61.
- 4.1.2 All other control valves used in the systems shall be of tight shut off design (zero leak) at room temperature with maximum shut off differential acting across the valve. All steam and water valves covered fall under the purview of IBR.
- 4.1.3 Maximum allowable stress values for ASME SA-182 F92 as per code shall be reduced by 10% for calculating the thickness of pressure parts.
- 4.1.4 Valve parts shall not vibrate or chatter and shall not be unduly noisy. Low noise trim, if required, shall be provided to ensure the noise level within limit.
- 4.1.5 Design of the HP Bypass valves shall be such that the velocity of steam exiting the valve shall not exceed 100 m/s.
- 4.1.6 Valve seat shall be welded and the valve seat areas shall be stellited. Sealing arrangement shall be provided so that no leakage takes place through valve glands.
- 4.1.7 The spray water valves shall be designed such that no separate warm up arrangement is required for spray water piping.
- 4.1.8 Necessary details for providing warming up arrangement of HP bypass valves shall be submitted along with the offer.
- 4.1.9 The spray valves for HP bypass shall have tight sealing arrangement in closed position so that no water can penetrate into the turbine with bypass valve closed.
- 4.1.10 The entire atomization and evaporation of spray water shall be complete within shortest possible distance but not exceeding 1.0m from the spray point.
- 4.1.11 All HP Bypass valves shall be butt weld type, edge preparation details of which shall be submitted by bidder for approval by the purchaser.
- 4.1.12 HP bypass valve body should be forged.

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

- 4.1.13 Maximum allowable stress values for ASME SA-182 F92 material as per code shall be reduced by 10% for calculating the thickness of pressure parts.**
- 4.1.14 All valves (both in steam and spray water service) shall be electro-hydraulically operated.**
- 4.1.15 The positioning electronics between the respective process controller and the actuator control shall have all necessary positioners for continuously controlled actuators, power modules, various converters, power supply & other fault monitoring & alarming modules, position transmitters, etc.**
- 4.1.16 The oil system for HP bypass system electro-hydraulic actuators shall be self-contained unit and shall meet system demand for all operating conditions. Oil system for HP bypass system shall be with 100% redundant pumps, motors, accumulators and control cubicles etc. A suitable filter shall be placed before each actuator. Oil used in hydraulic system is 'SERVO CONVAL-46', a mineral oil with viscosity grade ISO VG46.**
- 4.1.17 All the fittings used in the hydraulic piping and hydraulic hoses connecting the HPU and the valve actuators shall be in METRIC only.**
- 4.1.18 2x100% separate cooling-cum-filtration circuits (with 3 μ absolute filters) shall be provided in order to maintain the cleanliness of the system and to ensure proper cooling. Cooling circuit shall cut in and out depending upon the control fluid temperature. Cooling can be with air/water. In case of water cooling, water quantity and quality requirements shall be furnished by the vendor along with the offer for arranging the same by purchaser.**
- 4.1.19 Hydraulic Supply Unit circuit diagrams drawn on either metallic or plastic sheet in colour shall be riveted inside the door panel. Arrangements shall be made for mounting electric lamps inside the housing. Hydraulic power unit shall be with IP55 class protection or more.**
- 4.1.20 Hydraulic accumulators shall be provided in the system to ensure positive supply of adequate oil to the hydraulic actuators, even when oil pump is not available. The accumulators shall be sized to ensure oil supply for two (2) complete stroking operations of actuators in the bypass system.**
- 4.1.21 The accumulators shall be provided with Nitrogen pressurization system with bladder, shut off valves as required for the control system.**
- 4.1.22 Provision shall be made to isolate any of the provided accumulators for maintenance without switching off the oil System.**
- 4.1.23 To prevent over-pressure in the oil system, safety valves as necessary shall be provided.**
- 4.1.24 Total oil piping offered for each 800 MW unit shall be of 200 metres length. If the sizes of pipes in hydraulic system are more than one, exact length of each size shall be decided during detail engineering. The oil system shall be designed to meet the above requirements.**
- 4.1.25 The hydraulic oil pipes shall be supplied in lengths not exceeding 2.5m and to include minimum number of joints during erection.**
- 4.1.26 Hydraulic actuators shall have the facility to keep the control valves "stay put" on oil supply failure or electric power failure.**
- 4.1.27 HP Bypass steam control valves and spray water control valves should be equipped with position transmitters and 4 limit switches on each valve for measuring the position of the valve. Output of the position transmitter shall be 4mA (valve fully CLOSE) to 20 mA (valve fully OPEN).**
- 4.1.28 Spray Isolation valve should be equipped with 4 Limit switches (i.e., 2 for open and 2 for close position).**

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

- 4.1.29 Local position indicator scale shall be provided on actuator yokes to indicate position of valve locally.**
- 4.1.30 Nameplates shall be of white non-hygroscopic material with engraved black lettering and shall be suitably fixed on both front and rear sides. The nameplates shall have the following details minimum.**
- 4.1.30.1 Manufacturer's Model Number**
 - 4.1.30.2 Manufacturer's Serial Number**
 - 4.1.30.3 Size and pressure rating for inlet & outlet**
 - 4.1.30.4 Manufacturer's name/trade mark**
 - 4.1.30.5 Month & year of manufacture**
- 4.1.31 The following details of final control elements for proportional valves with blocking function, Fast opening solenoid valves, feedback transmitter / limit switch shall be provided along with the offer.**
- 4.1.31.1 Supply Voltage and variation in voltage**
 - 4.1.31.2 Power rating**
 - 4.1.31.3 Operating pressure**
 - 4.1.31.4 Operating temperature**
 - 4.1.31.5 Electrical connection details, etc,**
- 4.1.32 Write up on recommended control system logic and interface requirements with input signals shall be provided along with the offer.**
- 4.1.33 Field mounted junction boxes shall be supplied as per the following specification:**
- 4.1.33.1 No. of ways - 12/24/36/48/64/72/96/128(as applicable) with 20% spares terminals.**
 - 4.1.33.2 Material and Thickness - 4mm thick Fiberglass Reinforced Polyester (FRP) with protective coating.**
 - 4.1.33.3 Cable entry: Bottom or Side**
 - 4.1.33.4 Cable glands: Double compression type – Nickel plated Brass/SS316 with PVC hoods.**
 - 4.1.33.5 Mounting: Outdoor**
 - 4.1.33.6 No. of terminals: As required with standardization with 20% spare of each size & type.**
 - 4.1.33.7 Terminals: Phoenix/Wago (screw less rail mounted cage clamp type spring loaded suitable for conductor size up to 2.5 sq. mm)**
 - 4.1.33.8 Grounding: Two terminals for body and shield ground**
 - 4.1.33.9 Door: Hinged, lockable type.**
 - 4.1.33.10 Accessories: Suitable mounting clamps and other accessories shall be in scope of bidder. The brackets, bolts, nuts, screws, glands, lugs required for erection shall be of SS304, included in bidder scope of supply. High voltage & insulation resistance test shall also be conducted. M6 Ni plated Brass earthing stud shall be provided (external 2 nos. internal 1 no.) Gasket (Normal)- Neoprene/Polyurethane thickness 6.0 mm. Silicon for high Temp. area.**
 - 4.1.33.11 Colour: To be decided during detailed engineering & subject to owner's approval.**
 - 4.1.33.12 Protection Class – Weather proof IP-65 minimum.**

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

4.2 STEAM AND WATER VALVES

4.2.1 HP Bypass steam control valves, spray water isolation and spray water control valves shall be selected for the steam parameters indicated in Data sheet of this specification (Clause 8).

4.2.2 Offered valves shall be suitable for matching with pipes as indicated below:

HP BYPASS STEAM CONTROL VALVE CONNECTIONS (for piping)

Inlet side

Size : Inside Diameter 200 x Thickness 63
Material : SA335 P92
Matching Inside diameter : 200

Outlet side

Size : Outside Diameter 558.8 x Thickness 28.58
Material : SA335 P22
Matching Inside diameter : 506.8

HP BYPASS SPRAY ISOLATION VALVE CONNECTIONS (for piping)

Inlet & Outlet sides

Size : Outside Diameter 219.1 x Thickness 36
Material : SA106 Gr.C
Matching Inside diameter : 151

HP BYPASS SPRAY CONTROL VALVES CONNECTIONS (for piping)

Inlet & Outlet sides

Size : Outside Diameter 168.3 x Thickness 36
Material : SA106 Gr.C
Matching Inside diameter : 114.8

4.2.3 Spray water connection to HP bypass valve pipe size & Material: OD 168.3 x 30 & SA335 P22.
Matching Inside diameter : 114.8

4.2.4 NOISE LEVEL

The equivalent 'A' weighted sound pressure level measured at a height of 1.5 metre above floor level in elevation and a distance of 1 metre horizontally from the nearest surface of any equipment / machine, furnished and installed under this specification, expressed in decibels to a reference of 0.0002 microbar, shall not exceed 85 dBA. For HP bypass valves, noise level shall be within the limit of 90 dBA.

4.2.5 VALVE SUPPORT

Valve with actuators shall be installed vertically.

4.2.6 OPERATING TIME

HP Bypass valves

Fast opening time : 2-3 sec for full stroke
Opening & Closing time (modulating control) : 10-12 sec for full stroke

HP Bypass spray isolation and control valves

Opening & Closing time : 5-8 sec for full stroke

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

4.2.7 DRIP TRAY FOR VALVE ACTUATOR

For all actuators, a drip tray shall be provided to prevent oil from falling on valve body, in case of oil leakage.

4.3 INSTRUMENTS IN OIL SYSTEM

4.3.1 Measuring instruments and subsystems offered shall be from reputed experienced manufacturers of specified type and range of equipment, whose guaranteed and trouble free operation has been proven. Further, all instruments shall be of proven reliability, accuracy, and repeatability requiring a minimum of maintenance and shall comply with the acceptable international standards.

4.3.2 Three nos. of pressure transmitters to be provided for header pressure measurement. All pressure transmitters shall be microprocessor based 2 wire type and HART protocol compatible.

4.3.3 Each of the cooling-cum-filtration circuits shall contain one flow switch at the inlet of the filter for flow indication to the DCS and one differential pressure indicator for alarm at DCS along with local indication for clogging.

4.3.4 All line filters (filter before the actuator) shall be equipped with differential pressure indicators for alarm at DCS along with local indication for clogging.

4.3.5 Suitable pressure gauges to be provided on the oil System.

4.3.6 Three nos. resistance temperature detectors along with temperature transmitters to be provided for measuring the temperature of the hydraulic fluid in the tank.

4.3.7 Suitable level gauges and 3 Nos. level transmitters to be provided on the Tank for level measurement.

4.3.8 Contact rating of all the transmitters to be furnished.

4.3.9 Number and type of instruments shall be subject to BHEL approval. Complete instrument list showing range, model no and set point of various instruments shall be furnished for BHEL approval.

4.3.10 All transmitters shall be selected such that all the measured values fall between 25% and 75% of the full scale range.

4.3.11 Output of all transmitters shall be 4-20mA. There should be a provision to adjust the set points.

4.3.12 Housings of all the transmitters shall be weather proof as per IP-65, metallic housing with durable corrosion resistant coating.

4.4 C&I REQUIREMENTS

4.4.1 Vendor shall confirm the following without fail during enquiry stage without which the offer is liable to be rejected.

S.No.	Requirement	Vendor Confirmation
1	Positioner cabinet which positions the valve based on DCS command shall be provided.	



365-147/B
31.08.16

**BHEL – Tiruchirappalli – 620014,
India**

Valves Engineering and R&D

PURCHASE SPECIFICATION

DOC No: **SPEC:HP:0072** Rev: **00**

Effective Date: 06-06-2020

Page: **8** of **21**

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 M W

1.1	a) Power Supply requirement AC/DC to be mentioned. b) Cable scope of the same will be in vendor scope.	
2	Hydraulic Power Unit Controls has to be in DCS and Complete Logic has to be provided for implementation in DCS. Separate PLC control for Hydraulic Power Unit is NOT accepted.	
3	Complete Interface details with Termination details for Valves and Hydraulic Power unit has to be provided.	
4	Local Operation Cum Indication shall be Provided.	

EQUIPMENT	SIGNAL TYPE FROM DCS	DCS SIGNAL	Requirement	Vendor's remarks
HP BYPASS STEAM VALVES	AO	4-20mA Demand (4mA at 0% opening 20mA at 100% opening)	The offered system shall accept the indicated DCS signal.	
	AI	4-20mA Position Feedback to be provided to DCS	The offered system shall provide the feedback to DCS.	
	DO	FAST OPENING	Whether Potential Free/24 VDC/48 VDC Command from DCS to be clarified? If any other voltage, voltage value shall be indicated. Solenoid Current requirement shall be indicated.	
SPRAY CONTROL VALVES	AO	4-20mA Demand (4mA at 0% opening 20mA at 100% opening)	The offered system shall accept the indicated DCS signal.	
	AI	4-20mA Position Feedback	The offered system shall provide the feedback to DCS.	
SPRAY ISOLATION VALVE	DO	BD Valve Open Command	Whether Potential Free/24 VDC/48 VDC Command from DCS to be clarified? If any other voltage, voltage value shall be indicated. Solenoid Current requirement shall be indicated.	



365-147/B
31.08.16

**BHEL – Tiruchirappalli – 620014,
India**

Valves Engineering and R&D

PURCHASE SPECIFICATION

DOC No: **SPEC:HP:0072** Rev: **00**

Effective Date: 06-06-2020

Page: **9** of **21**

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

	DO	BD Valve Close Command	Whether Potential Free/24 VDC/48 VDC Command from DCS to be clarified? If any other voltage, voltage value shall be indicated. Solenoid Current requirement shall be indicated.	
	DI	Open Feedback	NO/NC contact shall be provided.	
	DI	Close Feedback	NO/NC contact shall be provided.	
Hydraulic Power Unit	AI	3 Nos. Pressure Transmitters	Each transmitter shall provide 4-20 mA output	
	AI	3 Nos. Temperature Transmitters	Each transmitter shall provide 4-20 mA output	
	AI	3 Nos. Level Transmitters	Each transmitter shall provide 4-20 mA output	
	DI	2 Nos. DP indicator switch(clogging)	NO/NC contacts for each switch shall be provided.	
	Details of any other transmitters / measuring instruments forming part of the Hydraulic Power Unit shall be provided			
	DO	Pumps 1&2 On Command	Whether Potential Free/24 VDC/48 VDC Command from DCS to be clarified? If any other voltage, voltage value shall be indicated. Power requirement shall be provided.	
	DO	Filter Pumps -1&2 On Command		
	DO	Cooling Fans-1&2 On Command		
	DO	Accumulator Charging Valves 1&2 On Command		
	DI	Pumps 1&2 On Feedback	NO/NC contact shall be provided for each component and each signal	
	DI	Pumps 1&2 Off Feedback		
	DI	Pumps 1&2 Fault Feedback		
	DI	Filter Pumps-1&2 On Feedback		
	DI	Filter Pumps-1&2 Off Feedback		
	DI	Filter Pumps-1&2 Fault Feedback		
	DI	Cooling Pumps-1&2 On Feedback		
	DI	Cooling Pumps-1&2 Off Feedback		
	DI	Cooling Pumps-1&2 Fault Feedback		
	DI	Cooling Pumps-1&2 Fault Feedback		



365-147/B
31.08.16

**BHEL – Tiruchirappalli – 620014,
India**

Valves Engineering and R&D

PURCHASE SPECIFICATION

DOC No: **SPEC:HP:0072 Rev: 00**

Effective Date: 06-06-2020

Page: **10 of 21**

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

DI	Accumulator Charging Valves 1&2 On Feedback	
DI	Accumulator Charging Valves 1&2 Off Feedback	

Legend: AI – Analog Input; AO – Analog Output; DI – Digital Input; DO – Digital Output

4.4.2 INSTRUMENTATION CABLES, CONTROL & POWER SUPPLY CABLES

Heat resistant instrumentation cable shall be provided for all instruments / equipments / drives / devices located in hot areas such as Oil system, HPBP areas etc. This cable shall be laid from instruments / equipments / drives / devices from hot area application to a field JB / panel located in areas where ambient temperature is below 50 Deg. C. For analog signals, individual pair shielding & overall shielding (type-F cable) & for Binary signals, only overall shielding of instrumentation cables (type-G cables) shall be provided.

4.4.2.1 Specification of Instrumentation Cable

4.4.2.1.1 Common Requirements

S.No	Property	Requirement
1	Operating Voltage	225 V (peak value)
2	Codes and standard	All instrumentation cables shall comply with VDE 0815, VDE 0207, Part 4, Part 5, Part 6, VDE 0816, VDE 0472, SEN 4241475, ANSI MC 96.1, IS-8784, IS-10810 (latest editions) and their amendments read along with this specification.
3	Continuous operation suitability	At 205 Deg.C
4	Marking:-	<i>a. Progressive automatic on-line sequential marking of length in meters to be provided at every one meter on outer sheath.</i> <i>b. Marking to read 'FRLS' to be provided at every 5 meters on outer sheath</i> <i>c. Durable marking at intervals not exceeding 625 mm shall include manufacturer's name, insulation material, conductor's size, number of pairs, voltage rating, type of cable, year of manufacturer to be provided on outer sheath.</i>
5	Allowable Tolerance on overall diameter	+/- 2 mm (maximum) over the declared value in data sheet
6	Variation in diameter	Not more than 1.0 mm throughout the length of cable.
7	Ovality at any crosssection	Not more than 1.0 mm
8	CAGE-CLAMP suitability	To be provided
9	Color	The outer sheath shall be of blue color.
10	Others	Repaired cables shall not be acceptable

4.4.2.1.2 Specific Requirements

Specification requirements	Type F&G cable
A. Conductors	
Cross section area	0.5 sq. mm
Conductor material	Annealed bare copper

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

Colour code	As per VDE-815
Conductor Grade	Electrolytic
No & dia of strands	7x0.3 mm (nom)
No. of Pairs	2/4/8/12/16/24/ 48
Max. conductor loop resistance per Km (in ohm) at 20 deg. C	73.4
Reference Standard	VDE : 0815
B. Insulation	
Material	Teflon (i.e.extruded FEP)
Thickness in mm (Min/Max)	0.4 / 0.50 (nominal)
Volume Resistivity (Min) in ohm-cm	2.8x 10¹⁴ at 20 deg. C & 2x10¹¹ at 205 deg. C.
C. Pairing & Twisting	
Max. lay of pairs (mm)	50
Single layer of binder tape on each pair provided	Yes
Bunch (Unit Formation) for more than 4P	To be provided
Conductor /pair identification as per VDE0815	To be provided
D. Shielding	
Type of shielding	Al-Mylar tape
Individual pair shielding	To be provided for F-type cable
Minimum thickness of Individual pair shielding	0.028mm (28 micron)
Overall cable assembly shielding	To be provided
Minimum thickness of Overall cable assembly shielding	0.055 mm (55 micron)
Coverage / Overlapping	100% / 20%
Drain wire provided for individual shield	Yes (for F-type) Size – 0.5 sq.mm No. of strands – 7 Dia of strands- 0.3mm Annealed Tin coated copper
E. Fillers (if applicable)	
Non-hygroscopic, flame retardant	To be provided
F. Outer Sheath	
Material	Teflon (i.e.extruded FRP)
Minimum Thickness at any point	0.4 mm
Nominal Thickness at any point	0.5 mm
Resistant to water, fungus, termite & rodent attack	Required
G. Electrical Parameters	
Mutual Capacitance Between Conductors At 0.8 Khz (Max.)	120 nF/km for F type 100 nF/km for G type
Insulation Resistance (Min.)	100 M Ohm/Km
Cross Talk Figure (Min.) At 0.8 Khz	
Characteristic Impedance (Max) At 1 Khz	320 OHM FOR F-TYPE 340 OHM FOR GTYPE
Attenuation Figure At 1 Khz (Max)	1.2 db/km
H. Complete Cable	

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

Complete Cable assembly	Shall pass Swedish Chimney test as per SEN-SS 4241475 class F3.
Flammability	Shall pass flammability as per IEEE-383 read in conjunction to this specification

All instruments like transmitters, switches, etc., shall be provided with a plug-in connector on the instrument side and shall be terminated to Cage Clamp (Rail Mount) type terminal blocks of the local Junction Box(JB) and with suitable crimping lugs.

Interconnecting cables on the JB side shall be ferruled with instrument TAG Nos.

4.4.2.1.3 Terminal Blocks

- All terminal blocks shall be rail mounted/post mounted, cage clamp type with high quality non-flammable insulating material of melamine suitable for working temperature of 105 deg. C.
- The marking on terminal strips shall correspond to the terminal numbering on wiring diagrams. At least 20% spare unused terminals shall be provided. All terminal blocks shall be numbered for identification and grouped according to the function. Engraved labels shall be provided on the terminal blocks.
- The terminal blocks shall be arranged with at least 100 mm clearance between two sets of terminal blocks and between terminal blocks and junction box walls.

4.4.2.2 Power and Control Cables

All standards, specifications and codes of practice referred to herein shall be the latest editions including all applicable official amendments and revisions as on date of opening of bid. In case of conflict between this specification and those codes, standards, etc., referred to herein, the former shall prevail. All the cables shall conform to the requirements of the following standards and codes: IS 1554-1, 3961, 3975, 5831, 7098 (Part-1), 8130, 10418, 10810, ASTM-D 2843, IEC 754 (part-1) and IEC 332.

4.4.2.2.1 Technical Requirements

- All cables including EPR cables shall be flame retardant, low smoke (FRLS) type designed to withstand all mechanical, electrical and thermal stresses developed under steady state and transient operating conditions as specified elsewhere in this specification.
- Aluminium conductor used in power cables shall have tensile strength of more than 100 N/sq.mm. Conductors shall be stranded.
- Conductor of control cables shall be made of stranded, plain annealed copper.
- PVC insulation shall be suitable for continuous conductor temperature of 70 deg C and short circuit conductor temperature of 160 deg. C.
- The cable cores shall be laid up with fillers between the cores wherever necessary. It shall not stick to insulation and inner sheath. All the cables shall have distinct extruded PVC inner sheath of black colour as per IS: 5831.

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

f. Outer sheath shall be of PVC as per IS: 5831 & black in colour. In addition to meeting all the requirements of Indian standards referred to, outer sheath of all the cables shall have the following FRLS properties.

- i) Oxygen index of min. 29 (as per IS 10810 Part-58).**
- ii) Acid gas emission of max. 20% (as per IEC-754-I).**
- iii) Smoke density rating shall not be more than 60 % (as per ASTM D-2843).**

g. Cores of the cables upto 5 cores shall be identified by colouring of insulation. Following colour scheme shall be adopted:

- 1 core - Red, Black, Yellow or Blue**
- 2 core - Red & Black**
- 3 core - Red, Yellow & Blue**
- 4 core - Red, Yellow, Blue and Black**
- 5 core - Red, Yellow, Blue, Black and Grey**

For cables having more than 5 cores, core identification shall be done by numbering the insulation of cores sequentially, starting by number 1 in the inner layer (e.g. say for 10 core cable, core numbering shall be from 1 to 10). The number shall be printed in Hindu-Arabic numerals on the outer surfaces of the cores. All the numbers shall be of the same colour, which shall contrast with the colour of insulation. The colour of insulation for all the cores shall be grey only. The numerals shall be legible and indelible. The numbers shall be repeated at regular intervals along the core, consecutive numbers being inverted in relation to each other. When the number is a single numeral, a dash shall be placed underneath it. If the number consists of two numerals, these shall be disposed one below the other and a dash placed below the lower numeral. The spacing between consecutive numbers shall not exceed 50 mm.

h. In addition to manufacturer's identification on cables as per IS, following marking shall also be provided over outer sheath:

- i. Cable size and voltage grade - To be embossed**
- ii. Word 'FRLS' at every 5 metre - To be embossed**
- iii. Sequential marking of length of the cable in metres at every one metre - To be embossed / printed.**

The embossing / printing shall be progressive, automatic, in line and marking shall be legible and indelible. For EPR cables identification shall be printed on outer sheath.

- i. All cables shall meet the fire resistance requirement as per Category-B of IEC-332 Part-3.**
- j. Allowable tolerances on the overall diameter of the cables shall be ± 2 mm maximum over the declared value in the technical data sheets.**
- k. In plant repairs to the cables shall not be accepted. Pimples, fish eye, blow holes etc. are not acceptable.**

1. Cable selection & sizing for Power Cables:

Cables shall be sized based on the following considerations:

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

(i) Rated current of the equipment

(ii) The voltage drop in the cable, during motor starting condition, shall be limited to 10% and during full load running condition, shall be limited to 3% of the rated voltage

(iii) Short circuit withstand capability

This will depend on the feeder type. For a fuse protected circuit, cable should be sized to withstand the letout energy of the fuse. For breaker controlled feeder, cable shall be capable of withstanding the system fault current level for total breaker tripping time inclusive of relay pickup time.

m. Cable selection & sizing for Control Cables:

Control cables shall be sized based on the following considerations:

(i) The minimum conductor cross-section shall be 1.5 sq.mm.

(ii) The minimum number of spare cores in control cables shall be as follows:

No. of cores in cable	Min. No. of spare cores
2C, 3C	NIL
5C	1
7C-12C	2
14C & above	3

n. Cable lengths shall be considered in such a way that straight through cable joints are avoided.

o. 1.1KV grade PVC power cables shall have aluminium conductor (compacted type for sizes above 10 sq.mm), PVC Insulated, PVC inner sheathed (as applicable) unarmoured, PVC outer-sheathed conforming to IS:1554 (Part-I).

4.5 MOTORS

4.5.1 For the purpose of design of equipment/systems, an ambient temperature of 50 deg. Centigrade and relative humidity of 95% (at 40 deg C) shall be considered. The equipment shall operate in a highly polluted environment.

4.5.2 All equipment shall be suitable for rated frequency of 50 Hz with a variation of +3% & - 5%, and 10% combined variation of voltage and frequency unless specifically brought out in the specification.

4.5.3 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.

4.5.4 Paint shade shall be as per RAL 5012 (Blue) for indoor and outdoor equipment.

4.5.5 Codes & Standards – IS/IEC:60034, IS 12615, IEC:60034-30

4.5.6 AC Motors - Squirrel cage induction motor suitable for direct-on-line starting.

4.5.7 AC Motors - Continuous duty LT motors shall be Premium Efficiency class-IE3, conforming to IS 12615, or IEC:60034-30.

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

- 4.5.8 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.**
- 4.5.9 Starting time - For motors with starting time upto 20 secs. at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be at least 2.5 secs. more than starting time.**
- 4.5.10 Torque Requirements - Accelerating torque at any speed with the lowest permissible starting voltage shall be at least 10% motor full load torque. Pull out torque at rated voltage shall not be less than 205% of full load torque.**
- 4.5.11 Starting Voltage Requirements – Upto 85% of the rated voltage.**
- 4.5.12 All motors shall be designed to meet IP55 as per IEC60034-05.**
- 4.5.13 All motors shall be either Totally enclosed fan cooled (TEFC) or totally enclosed tube ventilated (TETV) or Closed air circuit air cooled (CACA) type.**
- 4.5.14 Voltage level of motors of rating 0.2kW and above shall be 3 phase, 415V.**
- 4.5.15 Winding and Insulation of motors:**
- 4.5.16 (a) Type: Non-hygroscopic, oil resistant, flame resistant**
(b) Starting duty: Two hot starts in succession, with motor initially at normal running temperature.
(c) 415V AC motors: Thermal Class (B) or better
- 4.5.17 Motor body shall have two earthing points on opposite sides.**
- 4.5.18 The spacing between gland plate & center of terminal stud shall be as below:**
- | <u>Motor MCR in KW</u> | <u>Minimum distance between centre of stud and gland plate in mm</u> |
|-------------------------|--|
| Upto 3 KW | As per manufacturer's practice. |
| Above 3 KW - upto 7 KW | 85 |
| Above 7 KW - upto 13 KW | 115 |
- 4.5.19 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.**
- 4.5.20 The motors shall be suitable for bus transfer schemes provided on the 11kV, 3.3 kV /415V systems without any injurious effect on its life.**
- 4.5.21 The ratio of locked rotor KVA at rated voltage to rated KW shall not exceed 11.0 (without any further tolerance).**
- 4.5.22 Minimum inter-phase and phase-earth air clearances for LT motors with lugs installed shall be 10mm.**

4.6 ADDITIONAL SCOPE (LOOSE SUPPLY)

4.6.1 SPECIAL TOOLS & TACKLES AND SPECIAL EQUIPMENT

Bidder shall submit with the equipment, complete set of all special tools, tackles required for site erection, assembly, disassembly and proper maintenance of HP Bypass system. List of all special tools, tackles and special equipment shall be furnished along with the offer. The following special equipment are included in the scope of supply. Any other equipment required for commissioning of the system shall also be supplied by the supplier.

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

- a. Oil flushing device – consisting of a filter with fittings suitable to be connected to the return line of the oil piping during flushing of the oil piping. Sufficient number of filter elements of all required micron ratings, as per the vendor's commissioning requirements shall be included in the supply. One oil flushing device shall be supplied for each 800 MW unit.
- b. Nitrogen filling device – for filling nitrogen in the accumulators used in HP Bypass system. One Nitrogen filling device shall be supplied for each 800 MW unit.
- c. Steam blowing blanking arrangement - For each 800MW unit, Vendor shall supply two nos. steam blowing blanking arrangements of HP bypass Valves and furnish the blanking arrangement drawing for review. The offered steam blowing arrangement shall allow the steam blowing to be carried out after the valve is installed in the pipeline.
- d. Hydro test device - Device to be used to keep the HP bypass valves closed when the upstream piping is being subjected to hydro test shall be supplied. For each 800MW unit, Vendor shall supply two nos. hydro test devices and furnish the arrangement drawing for review.

4.4.1 SPARE PARTS FOR ERECTION & COMMISSIONING

It will be the responsibility of the bidder to provide all commissioning spares required for initial operation till satisfactory completion of the trial operation. Commissioning spares shall include minimum one set each of electrical connectors, gaskets, packing rings and seals for all valves, actuators, Hydraulic power unit, final control elements, fast opening devices and filters, one set of filter elements etc., The vendor shall furnish a detailed list of commissioning spares along with the offer and such list shall be reviewed by BHEL and mutually agreed to.

4.4.2 SPARE PARTS FOR 2 YEARS' OF OPERATION

Recommended spare parts list for 2 years' of operation shall be furnished along with the offer for each valve, actuator and HPU. Detailed list of spare parts with position no. shall be furnished in the O&M manual.

4.4.3 VALVE SEAT CUTTING & GRINDING MACHINE

Offer shall include 1 No. On-site HP Bypass valves seat cutting machine and 1 No. On-site seat grinding machine (common for all Units).

5 INSPECTION & TESTING

- 5.1 All HP Bypass valves shall be inspected, tested and stamped as per applicable code.
- 5.2 Material, Mechanical and Chemical tests shall be performed in a manner as specified in the relevant codes.
- 5.3 All valve pressure retaining parts shall be subjected to hydrostatic test pressure as required by the IBR and other applicable standards. The bidder shall guarantee his valve as capable of withstanding such hydrostatic tests and shall repair or replace, at his expenses, any item which fails to pass such tests at site.
- 5.4 Quality assurance plan for all components included in the scope shall be submitted along with the offer for BHEL's / owner's review & approval.
- 5.5 The material test certificates (correlated to melt number) shall be furnished by the bidder for identification and correlation.
- 5.6 For components like Body, Inlet & Outlet nozzles, Seat, Stem, plug, cage, Actuator cylinder, Yoke etc., material test certificates (typical) shall be furnished for identification & correlation.
- 5.7 100% Blue matching of seats shall be carried out and records shall be maintained for verification by BHEL.

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

- 5.8 Each HP Bypass valve and spray valve and pressure retaining parts shall undergo hydrostatic test as per IBR. Valves shall be inspected by independent inspecting authority approved by Indian Boiler Board and the test certificate in IBR Form IIIC duly countersigned by approved authority shall be submitted.
- 5.9 Seat Leakage test shall be conducted. There shall not be any visible leakage during this test. Form IIIC certificate to be furnished. Hydrostatic and seat leakage tests shall be witnessed by BHEL/end customer personnel.

6 ADDITIONAL REQUIREMENTS

- 6.1 Machined surfaces shall be suitably protected.
- 6.2 Valve ends shall be protected by means of metallic covers/polythene caps/rubber and protectors to prevent damage to ends & also to avoid foreign material entering the valve during transit & storage.
- 6.3 All the valves shall be packed suitably in wooden cases in order to avoid damage during transit and also during storage at site.
- 6.4 The Bidder shall adequately crate, block, anchor and protect equipment as required to prevent damage during overseas shipment and outdoor storage for a period of one (1) year at the site.
- 6.5 All threaded connections shall be plugged or capped with standard pipe plugs or caps.

7 DOCUMENT REQUIREMENTS

The following documents shall form part of the offer.

- 7.1 Clause wise confirmation to this technical specification shall be furnished.
- 7.2 If the bid submitted has got any deviation from this technical specification, the bidder shall furnish full particular of such deviations. Deviations are to be furnished with specific mention to clause number. Only such deviations will be discussed and resolved. Reasons / explanation for such deviations shall be furnished. Any other notes / comments viz. "refer to forwarding letter" etc. is not acceptable. Even if there is no deviation from the tender document, the Bidder shall indicate as "no deviations".
- 7.3 Cv test shall be carried out for HP Bypass valves, spray isolation and spray control valves as per ISA 75.02 and test report shall be submitted along with the offer for BHEL approval. In case test report is already available on the same size/model / type / rating of the valve proposed to be supplied under this specification and the Cv test has been either conducted at any independent laboratory or has been witnessed by an external inspection agency, the same shall be submitted if Cv test has been carried out within 5 years from the date of technical bid opening.
- 7.4 Detailed CFD reports for the rated parameters (Refer Cl.8 of this specification), in lieu of Cv tests specified under Cl. 7.1 above, are also acceptable. CFD reports can be submitted after PO placement.
- 7.5 Cross sectional drawings and General arrangement drawing with mounting details and recommended orientation of actuators w.r.t valve, BOM, Face to Face & overall dimensions, marking for identification of recommended spare components.
- 7.6 Materials of all parts & trim details to be furnished by bidder along with quote. If non-ASTM materials are used, equivalent ASTM materials shall be indicated in the BOM.



**BHEL – Tiruchirappalli – 620014,
India**

Valves Engineering and R&D

PURCHASE SPECIFICATION

DOC No: SPEC:HP:0072 Rev: 00

Effective Date: 06-06-2020

Page: 18 of 21

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

- 7.7 Valve sizing calculations.**
- 7.8 Sound Pressure Level calculations**
- 7.9 Details for providing warming up arrangement of HP bypass valves shall be submitted along with the offer**
- 7.10 Schematic drawing of the hydraulic circuit of the hydraulic power unit**
- 7.11 Weight of each S.No. of Clause No. 10 of the specification**
- 7.12 Datasheets of Valves, actuators**
- 7.13 Data sheet of Hydraulic Power Unit indicating the supply pressure and all other pressure settings**
- 7.14 Technical write-up on the function, operation and design features of valves and actuators**
- 7.15 Technical write-up on the function, operation and design features of hydraulic power unit, hydraulic system and components**
- 7.16 Oil piping connection diagram between the Hydraulic power unit and individual actuators**
- 7.17 Oil piping sizes and grade of material**
- 7.18 Catalogs and datasheets of all instruments, proportional valves, solenoids, etc., used in the HP Bypass system**
- 7.19 Drawing / documents submission schedule.**
- 7.20 Forces & Moments calculations for HP Bypass valves, weight of the valve when assembled with all the accessories.**
- 7.21 Valve opening / closing time details.**
- 7.22 Detailed Quality Plan for all valves, actuators, Hydraulic Oil System.**
- 7.23 Recommended spare parts lists for 2 years' of operation**

The following documents shall be submitted after order placement:

- 7.24 Sectional Drawing for HP Bypass valve**
- 7.25 Bill of material for HP Bypass Valve**
- 7.26 Sectional Drawing for Spray Isolation valve**
- 7.27 Bill of Material for Spray Isolation valve**
- 7.28 Sectional drawing for spray Control valve**
- 7.29 Bill of Material for spray Control valve**
- 7.30 Characteristic curves for HP Bypass Valve**
- 7.31 Characteristic curves for Spray Control Valve**
- 7.32 Dimensional drawing of HP bypass Valve**
- 7.33 Dimensional drawing of Spray Isolation valve**
- 7.34 Dimensional drawing of Spray Control valve**
- 7.35 Oil Supply unit scheme**
- 7.36 Legend of Oil Supply unit scheme & Functional Write-up**
- 7.37 Dimensional drawing of Hydraulic Power Supply Unit along with foundation details**
- 7.38 Valve Data Sheet**
- 7.39 HPSU Data Sheet**
- 7.40 Description of Hydraulic operation of valves**
- 7.41 Preheating arrangement of HP Bypass valves**
- 7.42 Filled-up datasheets enclosed as Annexure-A at the end of this specification**
- 7.43 Logics of Hydraulic Power Unit operation in Function Block Diagram (FBD) format**

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

- 7.44 Terminal Wiring Diagrams of all the junction boxes used in the HP Bypass system**
- 7.45 Instrument Datasheets**
- 7.46 MQP of all valves and Hydraulic Power Supply Unit**
- 7.47 Installation Instructions**
- 7.48 Drawings/ documents for all the special equipment offered against Cl. 4.5.**
- 7.49 Vendor shall submit the list of all the components which are bought from sub-vendors and furnish the make and model of each of the above components along with the offer.**
- 7.48 Maximum allowable forces and moments on each weld end of the valve shall be indicated in the dimensional drawings of the valves.**
- 7.49 Edge preparation details of all the valves shall be as per BHEL requirement. BHEL EP requirement will be provided after placement of P.O.**
- 7.50 All Port Connection sizes, type of hose end connections and diameters for hoses near the actuators**
- 7.51 Electrical and instrument Load List for the HP Bypass system.**
- 7.52 Field Weld Schedule and erection instructions for Site engineers.**
- 7.53 Shipment weight & volume details.**
- 7.54 Equipment preservation procedure during shipment, pre-erection storage period & extended storage period.**
- 7.55 Erection manual consisting of pre-checks, pre-requisites, recommendations, etc.,**
- 7.56 Commissioning manual consisting of pre-commissioning, commissioning, initial operation, etc.,**
- 7.57 Operation and Maintenance manual consisting of details of all valves, hydraulic actuator, final control elements, feedback transmitters, solenoid valves and catalogues for bought out items, interlocks, physical checkups, startup, shut down and protections, instructions regarding predictive, preventive, breakdown maintenance and overhauling - 2 hard copies and 8 soft copies after placement of order. One copy of detailed O&M manual consisting of, but not limited to, vendor manuals, troubleshooting guide, list of spares packed separately must accompany the shipment.**
- 7.58 O&M manual shall include copies of all software required for operating / tuning / maintenance of the components / equipment of HP bypass system. Detailed procedures for calibration / tuning of such components / equipment using the software shall form part of the O&M manual.**
- 7.59 A literature on caution / safety while handling equipment / system shall be furnished.**
- 7.60 All GA drawings, Test Certificates, Seat leakage test report, filled datasheets and Material test Certificates.**
- 7.61 In case of loose supply of components/systems, necessary drawings & instructions for assembly/subassembly shall be provided.**

The mere approval of documents like drawings, data sheets, wiring diagrams, actuator sizing calculations, flow calculations, etc., will not however relieve the bidder from meeting our specification requirements, relevant product and testing standard requirements and generally accepted engineering principles. Ultimately, the system has to perform satisfactorily at the service conditions and at the end user place.

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

8 SELECTION DATA FOR H.P. BYPASS VALVES

Parameter	Rated Capacity (65% BMCR)	House Load	Cold Start	Warm start	Hot Start	Mech. Design
Upstream Pr. (Kg/cm²(a))	270	270	108	108	108	298.7
Upstream Temp. (°C)	600	600	390	450	530	603 (IBR) 608 (ASME)
Steam Flow (T/Hr)	1664	1664	700	700	700	---
Downstream Pr. (Kg/cm²(a))	37.94	30.5	18	18	18	75.2
Downstream Temp. (°C)	360	360	310	360	360	512
Spray Water Pr. (Kg/cm²(a))	309.46	309.46	117	117	117	382
Spray Water Temp. (°C)	142.5	142.5	111	139	139	200

NOTES:

- 1) Flow indicated is for TWO numbers of valves.
- 2) HP bypass to be designed to accept continuous spray at a temperature of 110°C (min).
- 3) All the valves shall be capable of functioning against full upstream pressure while downstream pressure is zero.
- 4) Bidder shall attach the list of projects supplied with HP Bypass system for supercritical steam turbine generator units with a capacity of not less than 750 Ton/Hr for each valve for the above mentioned rated steam parameters (i.e., pressure and temperature), which are in successful operation for more than 1 year as on 03-March-2017. The performance certificate for HP Bypass system from atleast 1 plant for meeting the above criteria shall be submitted at the time of the offer.
- 5) Vendor shall offer only such equipment which will meet the provenness criteria as indicated against S.No. 4 above.

9 SUPERVISION DURING ERECTION-COMMISSIONING & TRAINING AT SITE

The vendor shall depute their representative at project site for erection & commissioning supervision. Charges for site supervision shall be included in the main offer for which the vendor has to provide justification in the offer. These charges shall be comprehensive and shall be inclusive of travel costs, accommodation and all other related expenses. Bidder shall consider 2 visits with a total duration of 7 days (excluding 2 days training program). This will be considered for offer evaluation.

The vendor shall conduct minimum 2 days training program at site regarding design/construction features, operation and maintenance of the supplied equipment (including C&I) for customer engineers and BHEL engineers during erection & commissioning.

The bidder shall clearly indicate the extent of association of their service engineer during erection and commissioning of the supplied equipment in their offer. Further, special instructions which are required to be followed at site during erection and commissioning shall be furnished by the vendor.



365-147/B
31.08.16

**BHEL – Tiruchirappalli – 620014,
India**

Valves Engineering and R&D

PURCHASE SPECIFICATION

DOC No: **SPEC:HP:0072** Rev: **00**

Effective Date: **06-06-2020**

Page: **21** of **21**

Product: HP TURBINE BYPASS SYSTEM – PVUNL PATRATU 3x800 MW

10 BREAK UP FOR SUPPLY OF HP BYPASS VALVES AND HYDRAULIC SYSTEM

Sl. No.	EQUIPMENT	PART NO.	Qty for one 800 MW unit	Qty for 3x800 MW
1	HP Bypass steam control valve with Electro-hydraulic actuator, feedback transmitter assembly, final control elements and electronic positioner	974510200000	2 Nos.	6 Nos.
2	HP Bypass Spray water Isolation valve with Electro-hydraulic actuator, limit switch assembly, final control elements and electronic positioner	974510200001	1 No.	3 Nos.
3	HP Bypass Spray water control valve with Electro-hydraulic actuator, feedback transmitter assembly final control elements and electronic positioner	974510200002	2 Nos.	6 Nos.
4	Hydraulic power unit with junction box assembly	974510200003	1 No.	3 Nos.
5	Hydraulic system components including stainless steel piping of material SA213 TP316Ti connecting the HPU and actuators, connecting fittings, filters, hoses, additional accumulators, fast opening device, Non return valves, ball valves, throttle valves etc..	974510200005	1 Set	3 Sets
6	Special tools - Complete set of all special tools & tackles and special equipment like oil filterability test device, oil flushing device, nitrogen filling device, spare filter element for flushing device, steam blanking device, hydro test device, etc., required for site erection, assembly, disassembly and proper maintenance of HP Bypass system (Refer Cl. 4.6 for clarity on quantity to be offered)	974510200006	1 Set	3 Sets
7	Commissioning spares - One set of seal kit (packing rings, O-rings and gaskets) for HP Bypass valves and spray valves, one set of all electrical connectors, one set of seal kit for each actuator, one set of seal kit for Hydraulic power unit, one set of seal kit for final control elements, one set of seal kit for fast opening devices, one set of seal kit for filters and one set of filter elements	974510200007	1 Set	3 Sets
8	HP Bypass system valves seat cutting machine with tools and accessories***	1 No.		
9	HP Bypass system valves seat grinding machine with tools and accessories***	1 No.		
*** - These items are not considered for evaluation of offer.				

Signature		
Name	M. Chaitanya Kumar	Mallemala Sujana Vinod
Designation	Senior Engineer	Manager
Date	06 June 2020	06 June 2020
Action	Prepared By	Reviewed and Approved By



BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014, India

GENERAL TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

1. QUOTATIONS:

- a. **BID system:** Offers are invited in any one of the below formats. The no. of bids to be submitted is mentioned in "Confirmation to the Terms and Conditions" attached.
- i. Two part bid: The offers are invited in Two part bid system (Part I will be Techno-commercial bid and part II will be Price Bid). Techno-commercially suitable vendors alone will be intimated for price bid opening.
- ii. Single part bid: ~~The offers are invited in Single part bid system (Price Bid alone). The vendor shall confirm to all of BHEL's technical & commercial conditions.~~

b. **Submission of offer:**

- i. Offer called through e-Procurement mode: The bidder shall submit the bid online in BHEL e-Procurement portal at <https://eprocurebhel.co.in/nicgep/app>

The bidder would be required to register on the above e-procurement portal for submitting their bids. Offers through email and hardcopy are not acceptable.

~~ii. Offer called through Non-e-Procurement mode: Each part of offer should be sent in a double cover separately and the same should be sealed and super scribed with details such as enquiry reference, name of the vendor, item of supply and due date of opening. Two or more quotations should not be sent in one cover. Price Bid should contain only "Price per unit" for each type. Offer should be sent to the below mentioned address:~~

~~The Tender Opening Cell / Valves
Room No. 26, Building 24
Bharat Heavy Electricals Limited
Tiruchirappalli - 620014, Tamil Nadu, India
Or
Email ID: tender_cell@bhel.in~~

- c. **Late offers:** Offer received after 2.00 pm on due date will be considered as Late offers. Late offers will not be considered under any circumstance.
- d. **Regulations:** Offers should be free from correction and erasures. Corrections if any must be attested. All amounts shall be indicated both in words as well as figures. In case of a difference between the amount quoted in words and figures, the amount quoted in words shall prevail.
- e. **PVC:** Price Variation clause not acceptable. Prices should be firm.
- f. **Catalogue:** Manufacturer's name, Trade Mark or Patent No. if any should be specified. Illustrative leaflets giving technical particulars are required along with quotation.
- g. **Samples:** Samples should be submitted separately, if specially requested in tender, before the due date of the enquiry. They should be clearly marked with the enquiry reference and date on the enclosing cover to facilitate identification.
- h. **GST Number:** GST registration number, HSN number (Item wise) with applicable taxes should be mentioned in the offer. If the vendor is not GST registered the offer is liable for rejection.
- i. **Deviation.** Any deviations from the specification are to be furnished separately as "Schedule of Deviation". If there is no deviation, vendor should indicate "No Deviation" in the offer.
- j. **Confirmation:** Confirmation for compliance is to be given in the offer for all the techno commercial conditions specified in the tender.

2. COMMERCIAL TERMS & CONDITIONS:

a. **Terms of Payment:**

For Indigenous Suppliers:

"95% direct payment after 60 days from the date of dispatch against site acknowledgement. Balance 5% of supply value plus 100% of Erection and commissioning portion of PO will be paid payment on successful commissioning at project site and submission of PBG valid for the warranty period."

Note: MOM made with BHEL site / customer after successful commissioning will be required to process the balance 10 % payment.



BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014, India

GENERAL TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

Any deviation in the above payment terms, any other conditions in payment terms or any other payment terms will not be accepted and offers will not be considered.

~~**For Foreign Suppliers:** Payment term is 100% payment on CAD basis after 60 days from the date of receipt of documents, specified in PO, at BHEL bank. Respective bank charges to respective account.~~

~~If supplier insists for LC, only Usance LC with 60 days' credit will be opened, one month prior to material readiness. Further loading will be considered @ 1.5% on the offered value. Hence, supplier shall intimate the material readiness accordingly for opening LC. LC validity period will be 90 days and for any extension, applicable charges will be to suppliers account.~~

~~Any deviation in the above payment terms, any other conditions in payment terms or any other payment terms will not be accepted and offers will not be considered.~~

~~**For New Suppliers:** For new suppliers not registered with BHEL, Trichy for the product, payment shall be made 60 days after receipt and acceptance of materials.~~

~~In case of foreign supplier, first lot of mutually agreed quantities shall be supplied with payment as CAD basis after 60 days from the date of receipt and acceptance of material. If insisted for LC after acceptance of first lot, only usance LC with 60 days' credit will be opened one month prior to material readiness.~~

- b. Liquidated Damage:** Liquidated damages shall be 0.5% of the total order value per week of the delay or part thereof, subject to a maximum of 10% of the total order value. For cases where staggered delivery schedule is stipulated by BHEL, LD shall be 0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the total order value.

Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offered value)

Under GST regime, BHEL has to discharge GST liability on LD recovered from suppliers. Hence applicable GST shall also be recoverable from suppliers on LD amount. Debit note will be issued by BHEL for this amount, indicating the respective supply invoice number.

c. Delivery Terms:

For Indigenous Suppliers: FOR /Patratu Project Site Basis & basis. The quoted Rate shall be inclusive of Packing, Forwarding and Freight. (Ex-Works, Freight to pay basis is not acceptable to BHEL.) Insurance will be on BHEL scope.

For Foreign Suppliers: CFR/CIF Chennai seaport as per Incoterms 2010.

- d. Validity of Offer:** Prices should be fixed and should be valid for period as mentioned in the "Confirmation to the Terms and Conditions" attached.
- e. Delivery period:** Delivery schedule will be as mentioned in the "Confirmation to the Terms and Conditions" attached.
- f. Guarantee period:** The vendor shall give a guarantee for the performance of his supplies for a period of **eighteen months** from the date of dispatch or **twelve months** from the date of commissioning whichever is earlier.
- g. Miscellaneous:** Any conditions which might have been quoted by the seller and are in contravention to the terms of PO and which have not been specifically accepted by Purchaser will not be applicable to the contract/PO.
- h. Performance Bank Guarantee:** If tender calls for Performance Bank Guarantee, vendor should provide a performance bank guarantee (PBG) in BHEL format for 10% of the total Purchase order value valid for warranty/guarantee period with an additional claim period of 3 months. PBG should be issued from list of consortium banks.
- i. Counter Offering:** If counter offering is applicable for the enquiry, the L1 rates will be counter-offered to other eligible vendors as per below points
- In case there are only two qualified offers for any item, the L1 rate will be counter-offered to the L2 vendor.
 - In case of more than two qualified offers for any item, the L1 rates will be counter-offered to maximum (n-1) vendors (where 'n' is the no. of techno-commercially qualified vendors) or the no. of vendors required (as mentioned in the "Confirmation to the Terms and Conditions" attached), whichever is lower.
 - In case a lower ranked vendor does not accept the counter-offered rates, the rates may be offered to next higher ranked vendor.
 - The manner of splitting of the enquiry quantity across L1 and counter-offer accepted vendors will be as per the ratios mentioned in the "Confirmation to the Terms and Conditions" attached.

3. COMPLIANCE / ACCEPTANCE REQUIRED FOR FOLLOWING POINTS TO ENSURE INPUT TAX CREDIT



BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014, India

GENERAL TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

- a. Response to Tenders for Indigenous supplier/Vendor will be entertained only if the vendor has a valid GST registration No (GSTIN) which should be clearly mentioned in the offer. If the Vendor is exempted from GST registration, a declaration with due supporting documents need to be furnished for considering the offer. Vendor under composition scheme should declare that he is a composition Vendor supported by the screen shot taken from GST portal. The dealer has to submit necessary documents if there is any change in status under GST.
- b. Supplier shall mention their GSTIN in all their invoices (incl. credit Notes, Debit Notes) and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain Invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no etc., then the Invoice No. which is linked/uploaded in GSTN network shall be clearly indicated), Billed to party (with GSTIN) & Shipped to party details, item description as per PO, Quantity, Rate, Value, applicable taxes with nomenclature (like IGST, SGST, CGST & UTGST) separately, HSN/ SAC Code, Place of Supply etc.
- c. Invoices will be processed only upon completion of statutory requirement and further subject to following:
 - i. Vendor declaring such invoice in Form GST ANX-1
 - ii. Receipt of Goods or Services and Tax invoice by BHEL
- d. All invoices shall bear the HSN Code for each item separately (Harmonized System of Nomenclature)/ SAC code (Services Accounting Code).
- e. As the continuous uploading of tax invoices in GSTN portal (in GST ANX-1) is available for all (i.e. both Small & Large) tax payers under proposed new GST Return System, all invoice raised on BHEL may be uploaded immediately in GST portal on despatch of material /rendering of services. The supplier shall ensure availability of Invoice in GST portal before submission of invoice to BHEL. Invoices will be admitted by BHEL only if the invoices are available in GSTN portal (in BHEL's GST ANX-2).
- f. A declaration to the effect that all invoice particulars are/were uploaded in the GSTN network/ portal & all tax liability as per GST rules and regulations have been and will be discharged, shall be mentioned in the invoice. If not mentioned in the invoice, a separate declaration shall be submitted as per the requirement of BHEL.
- g. All documents like Test Certificate, LR copy, any other document mentioned in PO, shall be sent along with the vehicle/consignment. For all consignments received within the calendar month, input credit will be availed within that month in line with monthly returns filing cycle. In case of any discrepancy in the document or non-submission of documents mentioned in the PO, then BHEL will not be able to accept or account the material, in such case availing of tax credit will be deferred to next month or so.
- h. In case of discrepancy in the data uploaded by the supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note or debit note (details also to be uploaded in GSTN portal) for the shortages or rejections in the supplies or additional claims, within the calendar month informed by BHEL.
- i. In cases where invoice details have been uploaded by the vendor but failed to remit the GST amount to GST Department (Form PMT-08 or Form GST RET-01 to be submitted) within stipulated time, then GST paid on the invoices pertaining to the month for which GST return not filed by the vendor will be recovered from the vendor along with the applicable interest (currently 24% p.a) and all subsequent bills of the vendor will not be processed till filing of the GST return by the vendor.
- j. Under GST regime, BHEL has to discharge GST liability on LD recovered from suppliers/contractors. Hence applicable GST shall also be recoverable from suppliers/contractors on LD amount. For this, debit note will be issued by BHEL indicating the respective supply invoice number.
- k. In case any changes in taxes and duties as per Gov. Notification (including GST), the same shall be applicable from time to time.
- l. Duplicate copy of the Invoice meant for the transporter should accompany the material as stipulated under CE Rules 52A and 172C OR 57CE.
- m. TDS on GST shall be applicable as per the GST Act.
- n. In case GST credit is denied to BHEL due to non-receipt or delayed receipt of goods and/ or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount claimed in the invoice shall be disallowed to the vendor.
- o. Where any GST liability arising on BHEL under Reverse Charge (RCM), the vendor has to submit the invoices to BHEL well within the timeline prescribed in GST Law, to enable BHEL to discharge the GST liability. If there is a delay in



BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014, India

GENERAL TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

submission of invoice by the vendor resulting in delayed payment of GST by BHEL along with Interest, then such Interest payable or paid shall be recovered from the vendor.

- p. GST TDS will be deducted as per Section 51 of CGST Act 2017 and in line with Notification 50/2018 – Central Tax dated 13.09.2018. GST TDS certificate which will be generated in GST portal subsequent to vendor accepting the TDS deduction in the GST portal, will be issued to the vendor.

4. SPECIAL PROVISIONS FOR MICRO AND SMALL ENTERPRISES (MSE):

- a. 25% of the tendered quantity is earmarked for MSE suppliers in this tender.
- b. If L1 vendor (or) Counter offer accepted vendor/s is from a Micro / Small enterprise which put together covers 25% of the total tendered quantum, the 25% earmarking provision is not applicable.
- c. Out of the 25% tendered quantity reserved for MSE suppliers, 6.25% shall be earmarked for procurement from MSE owned by SC / ST entrepreneurs. In the event of failure of such Micro and Small enterprises to participate in the tender process or meet the tender requirements and the L1 price, the 6.25% sub-target for procurement ear-marked MSE owned by SC / ST entrepreneurs shall be met with other MSE enterprise/s.
- d. 3% reservation for women owned MSEs within the above mentioned 25% reservation. In the event of failure of such Micro and Small enterprises to participate in the tender process or meet the tender requirements and the L1 price, the 3% sub-target for procurement ear-marked MSE owned by women entrepreneurs shall be met with other MSE enterprise/s. The definition for MSEs owned by Women Entrepreneurs is clarified as:
- In case of proprietary MSE, proprietor shall be woman.
 - In case of partnership MSE, the women partners shall be holding at least 51% share in the unit.
 - In case of private limited companies, at least 51% share shall be held by the women promoters.
- e. In case MSE vendor participating in the tender quotes within the price band of L1 +15%, they will be allowed to supply the portion of the requirement subject to acceptance of L1 price by MSE vendor. In case of more than one such MSE, the supply shall be shared proportionately, provided the available quantum can be split.
- f. In a tender where both MSE and Non-MSE Vendors have participated and non-MSE Vendor has become the lowest bidder and the quantum envisaged in the tender cannot be split, then the MSE vendor will be given preference for ordering the available quantum provided the MSE vendor quoted price is within L1 + 15%, and if the MSE vendor accepts the L1 rate.
- g. MSE suppliers can avail the intended benefits only if,
The vendor submits along with offer, a copy of the Udhayog Aadhar and a certificate, as per the format in Annexure-A, issued by a chartered accountant during the financial year of the date of part-1 bid opening, certifying that the quantum of investment in plant and machinery is within the permissible limit as per the act for relevant status (Micro or small).

(or)

The vendor has already submitted the above documents for the financial year of the date of part-1 bid opening and the MSE status has been updated in BHEL Trichy's records.

Non submission of such documents will lead to consideration of their bids at par with other bidders and MSE status of such suppliers shall be shifted to Non MSE supplier till the supplier submits these documents.

- h. Definitions of MSEs owned by SC/ST is under:
- In case of proprietorship firm, proprietor must be SC/ST.
 - In case of partnership firm, the SC/ST partners must be holding at least 51% shares in the unit.
 - In case of private limited companies, at least 51% share must be held by SC/ST promoters.
 - The caste/Tribe/Community certificate issued by the following authorities in the prescribed form for SCs/STs can be considered.
- i. Authorized to Issue SC/ST certificate:
- District Magistrate/Additional District Magistrate/Collector/Deputy commissioner/Additional Deputy Commissioner/Deputy collector/1st class stipendiary magistrate/Sub divisional Magistrate/Taluka Magistrate/Executive magistrate/Extra Assistant commissioner.
 - Chief Presidency magistrate/Additional chief presidency magistrate/Presidency magistrate.
 - Revenue Officer not below the rank of tehsildar.
 - Sub-Divisional officer of the area where the individual and / or his family normally resides.
- j. To avail the benefits of MSE under SC/ST category, the related documents as stated above should be submitted along with tender documents.
- k. Payment for MSE vendors will be as per MSMED Act, 2006.



BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014, India

GENERAL TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

5. RISK PURCHASE PENALTIES

- a. In case of delay in delivery beyond PO delivery /mutually agreed delivery, or vendor fails /refuses to complete the PO as per terms, or insufficient facilities at vendor's works to execute a PO, BHEL has the right to get the items ordered elsewhere at the risk and cost of the vendor with notice to the vendor and the additional expenditure / difference in cost, if any, including consequential cost shall be recovered from the defaulted vendor. Also, in such case of withdrawal of orders, BHEL shall recover the additional expenditure / difference from vendor by adjusting against amount due to vendor and/or by invoking the BG and/or by any other suitable means as decided by BHEL. In addition, BHEL may recover from the defaulter vendor any loss to BHEL arising due to withdrawal of orders in such case, and action shall be taken as per latest revision of BHEL Guidelines for Suspension of Business dealings with Suppliers / Contractors.
- b. BHEL has the right to divert/cancel the order if the vendor has not procured minimum 50% of the quantity of raw materials within 60 days from PO date. Purchase order placed on steel mills and with proper payment voucher/proof will be considered for not cancelling the PO by BHEL. The submission of data by vendor for DB clearance by BHEL/QC shall be the proof of procurement. This is to avoid delay in project schedule due to delay in raw material procurement by vendors. In case the vendor fails to procure at least 50% of the quantity of raw materials within 60 days from PO date, BHEL has the right to get the items ordered elsewhere at the risk and cost of the defaulting Vendor and the additional expenditure / difference in cost, if any, including consequential cost shall be recovered from the defaulting Vendor and action shall be taken as per latest revision of BHEL Guidelines for Suspension of Business dealings with Suppliers / Contractors and SEARP.
- c. The defaulted vendor shall be liable for any loss, which BHEL may sustain by reason of such risk purchases in addition to liquidated damages as mentioned under LD clause.
- d. Vendors pending payments shall be withheld to cover the liabilities of BHEL towards risk purchase, if any.
- e. Reasons like power cut, labour issues, machine break down, etc. which are controllable by the sub-contractor shall not be accepted as reason for delay for delivery extension purposes.
- f. If PO delivery needs to be extended for reason attributable to BHEL, vendor may request BHEL in writing for delivery extension with justifications within 15 days from date of PO closure and before invoice.
- g. Process of calculating the risk and cost amount is as follows:

$$\text{Risk \& Cost Amount} = [(A-B) + (A \times H/100)]$$

Where,

A= Value of Balance scope of Work/ Supply (*) as per rates of new contract

B= Value of Balance scope of Work/ Supply (*) as per rates of old contract being paid to the contractor/ supplier at the time of termination of contract i.e. inclusive of PVC & ORC, if any.

H = Overhead Factor to be taken as 5

In case (A-B) is less than 0 (zero), value of (A-B) shall be taken as 0 (zero).

*(Balance scope of work/ supply)

Difference of Contract Quantities and Executed Quantities as on the date of issue of Letter for 'Termination of Contract', shall be taken as balance scope of Work/ Supply for calculating risk & cost amount. Contract quantities are the quantities as per original contract. If, Contract has been amended, quantities as per amended Contract shall be considered as Contract Quantities. Items for which total quantities to be executed have exceeded the Contract Quantities based on drawings issued to contractor from time to time till issue of Termination letter, then for these items total Quantities as per issued drawings would be deemed to be contract quantities. Substitute/ extra items whose rates have already been approved would form part of contract quantities for this purpose. Substitute/ extra items which have been executed but rates have not been approved, would also form part of contract quantities for this purpose and rates of such items shall be determined in line with contractual provisions. In-case portion of work is being withdrawn, contract quantities pertaining to portion of work withdrawn shall be considered as 'Balance scope of work/supply' for calculating Risk & Cost amount.

- h. Vendors are cautioned that, withdrawal after price bid opening or after contract signing or PO/LOI acceptance will be construed as tampering with BHEL's tender process. Suitable action for suspension of further business with the vendor may be taken as per BHEL corporate procedures.
- i. Abridged version of extant 'Guidelines for suspension of business dealings with suppliers/ contractors' has now been uploaded on www.bhel.com on "supplier registration page" at the following link:



BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014, India

GENERAL TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

http://www.bhel.com/vender_registration/vender.php (Guidelines for suspension of business dealings with suppliers/contractors).

6. GENERAL CONDITIONS

- a. The manner of finalization will be as mentioned in the "Confirmation to the Terms and Conditions" attached. Separate orders will be released for each project and documents should be supplied for each order separately.
- b. BHEL reserves the right to reduce the tender quantity and to NOT to order for some or all material based on the changes in project.
- c. BHEL shall have the right to visit vendor works during the execution of contract along with end customer for verifying status, inspection and testing of the material.
- d. BHEL reserves the right to negotiate or re-float the tender in case the quoted prices are not acceptable.
- e. Supplier shall arrange packing to avoid lose or damages during Road Transport, Site handling & Storage.
- f. BHEL reserves the right to reject the offer of a particular bidder due to unsatisfactory past performance in the execution of a contract at any of BHEL projects / units.
- g. The Drawings and Technical documents given in this enquiry are the sole property of BHEL. This should not be misused in any form.
- h. Purchase Order, PO Item serial number, Material code, Quantity should be clearly marked on the packing
- i. Confirmation for compliance is to be given in the offer for all the conditions specified above and to the respective Purchase Specification.
- j. The bidder along with its associate/collaborators/sub-contractors/sub-vendors/consultants/service providers shall strictly adhere to BHEL fraud prevention policy (refer www.bhel.com) and shall immediately bring to the notice of the BHEL management about any fraud or suspected fraud as soon as it comes to their notice.
- k. For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018, 29.05.2019 and 04.06.2020, issued by DPIIT, Ministry of Commerce and Industry. If any 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 and / or local content in respect of this procurement, same shall be applicable. Default purchase preference shall be 20% to local suppliers with default minimum local content of 50%.

1. Force Majeure clause

a. Notwithstanding the provisions contained in other clauses, the supplier shall not be liable for imposition of any such sanction so long the delay and/or failure of the supplier in fulfilling its obligations under the contract is the result of an event of Force Majeure. For purposes of this clause, Force Majeure means an event beyond the control of the supplier and not involving the supplier's fault or negligence and which is not foreseeable and not brought about at the instance of the party claiming to be affected by such event and which has caused the non – performance or delay in performance. Such events may include, but are not restricted to, wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes excluding by its employees, lockouts excluding by its management, freight embargoes and Acts of GOD.

b. If a Force Majeure situation arises, the supplier shall promptly notify the Purchaser/Consignee in writing of such conditions and the cause thereof within twenty-one days of occurrence of such event. Unless otherwise directed by the Purchaser/Consignee in writing, the supplier shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

c. If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of Force Majeure for a period exceeding sixty days, either party may at its option terminate the contract without any financial repercussion on either side.

d. In case due to a Force Majeure event the Purchaser/Consignee is unable to fulfil its contractual commitment and responsibility, the Purchaser/Consignee will notify the supplier accordingly and subsequent actions taken on similar lines described in above sub-paragraphs.



BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014, India

GENERAL TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

m. Resolution of Disputes

- a. If dispute or difference of any kind shall arise between the Purchaser/Consignee and the supplier in connection with or relating to the contract, the parties shall make every effort to resolve the same amicably by mutual consultations.
- b. Venue of Arbitration: The venue of arbitration shall be the place from where the contract has been issued, i.e., BHEL Trichy.
- c. Jurisdiction of the court will be from the place where the tender enquiry document has been issued, i.e., Trichy, India

7. DOCUMENTATION:

- a. **With Consignment:** Duplicate for transporter copy, Original Invoice, Packing List, Delivery Challan, O&M manual (if applicable) Material Test Certificate, Test Certificates, Compliance Certificate, Guarantee/Warranty Certificate and other documents mentioned in PO/TDC/Drawing.
- b. **To Purchase:**
 - i. **FOR BHEL TRICHY case-** Original Invoice, Duplicate for transporter copy, Packing list, LWB and Delivery challan, GST declaration as mentioned in point 3c.
 - ii. **FOR Site case-** Original Invoice, Original LWB, Original Packing List, Original IBR documents, Original despatch clearance Certificate and Inspection report, Test certificates as per PO, Original Site Acknowledgment etc.
- c. **Identification:** Material code, Purchase Order, PO item serial number, Unique serial number if any should be provided in all despatch documents, materials and packing clearly.

8. TENDER EVALUATION:

- a. **Techno-commercial Bid.**
 - i. All vendors should submit General arrangement drawing, datasheet and C&I diagram (if any) of the offered product
 - ii. Point by point technical confirmation of all pages of our technical specifications and commercial conditions are required with your sign and seal along with techno commercial offer.
 - iii. Offers from supplier not having technical capability or not agreed for commercial terms, will be rejected.
- b. **Price Bid.**
 - i. Bidders qualified for part I will be intimated for participating in priced bid opening.
 - ii. L1 bidder will be decided based on landed cost for the equipment to BHEL.

Indigenous Vendors

Total Landed cost/rate for each item = FOR Rate in INR (A) + Applicable Taxes (B) + Loading non-acceptance of commercial terms (C) – Applicable input tax credit (D)

A - Indigenous vendors submit offers on Free on Road (FOR), Stores, HPBP BHEL Trichy in INR.

B - Applicable GST and any other charges quoted by indigenous vendors will be added to the base price.

C - Loading for non-acceptance of payment terms, delivery schedule & liquidated damages (LD) will be added to the F.O.R. value for arriving the landed rate.

D - However, input tax credit shall be availed for GST, hence the same is excluded for arriving at the landed cost.

Foreign Vendors

Total Landed cost = CFR Rate in INR (A) + Applicable Duties (B) + Incidental Charges (C) + Loading for Container Shipment (D) + Loading for non-acceptance of commercial terms (E)

A - Foreign vendors to submit offers on CFR (Cost & Freight), Chennai port (LIFO – Liner In; Liner Out) basis per item wise in foreign currency, which will be converted to INR by multiplying with the Exchange rate (SBI TT Selling rate) as on the technical bid opening date. If the date of opening happens to be a bank holiday, then the forex rate as on previous bank (SBI) working day shall be taken.

BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014, India

GENERAL TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

- B - Customs duty, Safe guard duty (as per the notification No 02/2014-Customs (SG) dated 13th August 2014) and antidumping duty (as per the notification No 18/2016-Customs (ADD) dated 17.05.2016) as if applicable will be added to the INR price.
- C - Incidental charges will be added to the CFR Value. The incidental charge is inclusive of port handling charges, & freight charges for movement from Chennai port to BHEL, Trichy.
- D - In case of shipment through containers, if 14 free days for Container detention is not provided in the offer, a loading of 22% on the freight rate per MT shall be considered by BHEL for arriving at the Total Landed Cost.
- E - Loading for non-acceptance of payment terms, delivery schedule & Liquidated Damages (LD) will be added to the CFR value for arriving at the landed cost.

iii. In case of tie for the L1 positions,

- a. In the course of evaluation, if more than one bidder happens to occupy L1 status, effective L1 will be decided by soliciting discounts from respective L1 bidders.
- b. In case more than one bidder happens to occupy the L1 status even after soliciting discounts, the L1 bidder shall be decided by a toss/draw of lots, in the presence of the respective L1 bidders(s) or their representative(s).
- c. Ranking will be done accordingly, BHEL's decision in such situation shall be final and binding.

iv. If counter-offer is applicable and before counter offer process, if there is tie for ranking position other than L1 in respective enquiry items, then Lot shall be done to break the tie. Based on the outcome of LOT, subsequent tender ranking will be revised. Load distribution shall be based on revised ranking. The LOT process to break tie in tender ranking will be based on random number generation in MS-Excel sheet.

Tie breaking procedure has been explained below with an example:

There is an item (item sl. no. 210) for which tie breaking has to be conducted. Hence, the lot will be based on random number generation in MS-Excel sheet.

1. Item wise excel sheet in which all ranks for which tie is present shall be opened.
2. Random number shall be generated against each entry in the excel sheet. Once random number is generated, the values will be frozen against each entry.
3. The rank order shall be sorted in the following manner.
Sorting -> 1. Item -> 2. Actual rank -> 3. Random number wise (from lowest to highest).
Once sorting is done, each vendor shall be ranked as per the sorting order.

• **Illustration:**

Step-1: Before Sorting:

Item No.	Vendor code	ORIGINAL Rank before CO
210	A	L01
210	B	L02
210	C	L03
210	D	L03
210	E	L04
210	F	L05
210	G	L05
210	H	L06

Step-2: After random number generation

Item No.	Vendor code	ORIGINAL Rank before CO	Random Number
210	A	L01	0.639156
210	B	L02	0.931402
210	C	L03	0.560449



Maharatna Company

BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014, India

GENERAL TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

210	D	L03	0.507298
210	E	L04	0.621819
210	F	L05	0.620683
210	G	L05	0.504936
210	H	L06	0.793407

Step-3: Final sorting and revised ranking:

Item No.	Vendor code	ORIGINAL Rank before CO	Random Number	Final Revised Rank
210	A	L01	0.639156	L01
210	B	L02	0.931402	L02
210	D	L03	0.507298	L03
210	C	L03	0.560449	L04
210	E	L04	0.621819	L05
210	G	L05	0.504936	L06
210	F	L05	0.620683	L07
210	H	L06	0.793407	L08

Final revised ranking shall be intimated to vendors. Final revised ranking shall be worked out based on the result of tie-breaking and counter offering process shall be based on the final revised ranking.

L1 rate shall be counter offered to eligible Vendors in respective enquiry items in order of the distinct ranking arrived after tie-breaking process has been concluded.

9. IMPORTANT INFORMATION FOR FOREIGN SUPPLIERS:

- Port of loading should be indicated in the offer without fail.
- Port of discharge should be Chennai Sea/Air Port, India.
- The preferred shipment mode "Containerized Cargo or Break Bulk" shall be specified clearly in the offer.
- In case of CFR INCO TERMS - CONTAINERIZED CARGO**
 - In case of CFR terms, moved through CONTAINERS (Suppliers should clearly specify this in their offer) it would be presumed by BHEL that the freight charges quoted is on LILO (LINER IN LINER OUT) basis including extra charges, if any, like Container Imbalance Charges, Trade Imbalance charges or any other charges payable to the Liner. No other charges other than the quoted Freight rate will be paid by BHEL excepting applicable Terminal Handling Charges, Container cleaning Charges, DO charges to Shipping Liner at Discharge Port. 14 FREE DAYS for Container detention shall be provided. If any deviation is taken by Tenderer, a loading of 22% on the freight rate per MT shall be considered by BHEL for arriving at the Total Landed Cost.
 - In case of shipment through Containers on CFR basis, the BL should bear the endorsement that "14 free days for Container Detention is applicable".
- In case of CFR INCO TERMS - BREAKBULK CARGO:** In case of CFR terms, moved through BREAK BULK BASIS (Suppliers should clearly specify this in their offer) it would be presumed by BHEL that the freight charges quoted is on LILO (LINER IN LINER OUT) basis. The materials will be Custom cleared from Port itself.
 - The Indian Customs imposed, a penalty on late filing of Bill of Entries (Air/Sea Shipments) by the importer. The maximum free time allowed is 24 hrs from the time of arrival of cargo at final port of discharge. Rs.5000/- per day (for Initial 03 days) & Rs.10000/- per day (thereafter)
 - The vendor should furnish the Non-Negotiable Documents (Air Way Bill/Bill of Lading, Commercial Invoice, Packing List, and Certificate of Origin) either by email or post/courier to BHEL well before the landing of cargo at final port of discharge.
 - Vendor will be held responsible for the penalty arises against the late filing of Bill of entry due to:
 - Non availability of Non-Negotiable Documents (NNDs) before the cargo arrival
 - Discrepancy in documents



BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014, India

GENERAL TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

- c. Short landing of Consignments (For shipments on CFR/CPT/CIF/CIP – Chennai Port)
- iv. All the shipments for the contracts (POs) finalized on CFR -Chennai Port basis
 - a. Delivery Orders involving multiple agencies like liners/freight forwarders are not allowed. There must be a single agency office at the final discharge Port (Chennai) for issuing the Delivery Order to BHEL.
 - b. The detention/demurrage charges arise due to the delay in collection of Delivery Orders from multiple agencies of liner/freight forwarder also whose offices are not at available Chennai, the same amount will be deducted from Vendor's bills only.
 - c. Apart from the normal charges like Terminal Handling Charges, Container cleaning Charges, Delivery Order Charges at final port of discharge no other charges will be borne by BHEL.
 - d. The liner/freight forwarders should be properly communicated by the Vendor for not to claim such charges for issuing Delivery Order. If the liner/freight forwarder claims such charges in their invoices, the same amount will be deducted from the Vendor bills without any prior intimation in order to avoid the delay in Customs clearance.

The likely additional/hidden costs or charges are:

- i. CIC - Container Imbalance Charges/Surcharges
- ii. EIC - Equipment Imbalance Charge/Surcharges
- iii. CAF - Container/Currency Adjustment Factor
- iv. BAF - Bunker adjustment Factor
- v. RDS - Rupee Depreciation Surcharge
- vi. CDS - Currency Depreciation Surcharge

f. Transport Conditions for Import:

The Original Documents (Bill of Lading, Invoice, Packing List, Certificate of Origin & Test Certificate) shall reach BHEL well in advance before the vessel arrival. The soft copies of the above shall be forwarded to BHEL immediately after shipment.

- i. In the event of delayed submission of documents by the supplier, an amount up to 5% of the invoice value will be retained towards demurrage & other charges and the difference if any between actual charges and recovery will be settled separately through supplementary invoice.
- ii. 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".
- iii. Otherwise, No-objection Certificate shall be issued to the Liner, authorizing BHEL to get the Delivery Order without producing the Original Bill of Lading.
- iv. This is required to ensure avoidance of demurrage at Chennai Sea-port that may arise in case of delayed presentation of documents by the Seller.

Following details to be endorsed in OBL

- i. Import & Export Code (IEC) of importer: 0588138690
- ii. GST Identification No (GSTIN) of importer: 33AAACB4146P2ZL
- iii. Official email id of importer: sivabala@bhel.in ; siyama@bhel.in

d. Indian Agent & Agency commission:

- i. An Indian Agent can represent / submit offer of only one original equipment manufacturer (OEM) against a particular Tender. If any Indian Agent represents two or more than one OEM against the same tender, then the Offer will be rejected.
- ii. The CFR - Cost and Freight Chennai Sea Port, price quoted by the Foreign Bidder shall also include the Agency commission. The bidder shall furnish authenticated copy of the Agency Agreement detailing the precise relationship between them and their mutual interest in the business so as to consider the offer of the Indian Agent for the indigenous portion of the supply. For the main equipment, the offer should be from the Principal / OEM. The bidders have to furnish the original Authorization Letter for the Indian Agent along with the Techno-Commercial Offer.

10. INTEGRITY PACT (IP)

- a. IP is a tool to ensure that activities and transactions between Company and its Bidders/Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

Sl.	IEM	Email
1	Shri Arun Chandra Verma, IPS (Retd.)	acverma1@gmail.com



Maharatna Company

BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014, India

GENERAL TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

2	Shri Virendra Bahadur Singh, IPS (Retd.)	ybsinghips@gmail.com
---	--	--

- b. If IP is applicable for the enquiry, the IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with the 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.
- c. Please refer Section-8 of the IP for Roles 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 clarifications / issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below

(1)
Avinash V
Sr. Engineer
Valves Purchase
24 Building, 3rd Floor,
BHEL, Trichy-620014
+91 431 2574797
neerajkumar@bhel.in

(2)
A Wilfred Joseph
AGM
Valves Purchase
24 Building, 3rd Floor,
BHEL, Trichy-620014
+91 431 2578146
wiljoe@bhel.in

Certificate by Chartered Accountant on letter head

This is to Certify that M/s
 (hereinafter referred to as 'company') having its registered office at
 is registered under MSMED Act 2006, (Enterprise Memorandum No (Part-II) dtd:.....,
 Category: (Micro/Small), (Copy enclosed).

Further verified from the Books of Accounts that the Investment of the company as per the latest audited financial year as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O.1722(E) dated October 5,2006:
 Rs. Lacs
2. **For Service Enterprises:** Invest in equipment (i.e. original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:
 Rs. Lacs

(Strike off whichever is not applicable)

The above investment of Rs.....Lacs is within permissible limit of Rs.....Lacs for..... Micro/Small (Strike off which is not applicable) Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro/Small) (Strike off which is not applicable) and the date of graduation of such enterprise from its original category is (dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S.O.No. 3322(E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by the Ministry of MSME.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant



BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014. India

CONFIRMATION TO TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

<u>TERMS & CONDITION</u>	<u>VENDOR CONFIRMATION</u>
a. Quotation No and date	
b. Supplier shall be indigenous supplier.	
c. Vendor should give confirmation to BHEL's Technical Specification. Any deviations from the specification are to be furnished separately as "Schedule of Deviation". If there is no deviation vendor should indicate "No Deviation".	
d. The offer has to be submitted as a Two-part bid i.e. 1. Techno-commercial 2. Price bid	
e. Terms of Payment: Indigenous Supplier (Non-MSE): Main supply: "95% direct payment after 60 days from the date of dispatch against site acknowledgement. Balance 5% of supply value plus 100% of Erection and commissioning portion of PO will be paid payment on successful commissioning at Patratu project site and submission of PBG valid for the warranty period." Indigenous Supplier (MSE): Payment will be as per MSMED Act, 2006 with 95% to 5% split as above. Suppliers quoting for MSE payment must produce CA certificate (original), based on audited reports of FY 2019-2020, in the enclosed template in terms and conditions (signed and sealed in CA's letter pad) and copy of UAM. If submitted earlier, same shall be informed. OR Suppliers quoting for MSE payment must produce Udyam registration certificate in part 1 bid documents.	
f. Liquidated Damage: LD shall be 0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the total order value.	
g. Delivery Terms: Prices shall be quoted on " FIRM PRICE " basis only. For Indigenous Supplies: : FOR /Patratu Project Site Basis &. The quoted Rate shall be inclusive of Packing, Forwarding and Freight. (Ex-Works, Freight to pay basis is not acceptable to BHEL.)	
h. Validity of Offer: Prices should be valid for 120 days from the date of part-1 bid opening of this tender. The delay in responding to BHEL technical clarification beyond four days will be subsequently added to the validity period, Revised Price Bids will not be encouraged	
i. Delivery period: Delivery period should be 48 weeks from the date of document approval for Unit 1 and Unit 2 and 72 weeks from the date of document approval for Unit 3. Vendor quoted delivery period shall include all the activities i.e. manufacturing / production, Inspection, Packing, Forwarding and dispatch.	
j. Risk Purchase: Risk purchase penalties as per clause 5 of general terms and conditions is applicable for this enquiry. Non acceptance to risk purchase clause the offer is liable for rejection.	
k. Guarantee Clause: The vendor shall give a guarantee for the performance of his supplies for a period of eighteen months from the date of dispatch or twelve months from the date of commissioning whichever is earlier.	
l. Performance Bank Guarantee: Vendor should provide a performance bank guarantee (PBG) in BHEL format for 10% of the total Purchase order value valid for warranty/guarantee period with an additional claim period of 3 months. PBG should be issued from list of consortium banks	



BHARAT HEAVY ELECTRICALS LTD

VALVES PURCHASE

Trichy - 620 014. India

CONFIRMATION TO TERMS AND CONDITIONS

Enquiry Reference: ENSFV00233

<u>TERMS & CONDITION</u>	<u>VENDOR CONFIRMATION</u>
m. Local content certificate: Supplier shall submit the local content certificate with self-declaration in part 1 bid documents.(Refer sample for local content certificate in attachment)	
n. Counter-offering Counter-offering is not applicable for this enquiry.	
o. Inspection: Inspection shall be done by BHEL/TPIA and NTPC at vendor works as per VQP approved by NTPC. Indexing, based on Quality Plan, clause shall be part of Test reports and Test certificates submitted	
p. Document submission: In case of PO, documents (drawings, data sheets and quality plan) shall be submitted within 14 days from the date of receipt of PO and the revised documents shall be submitted within 1 week from the date of receipt of engineering / quality comments. Any delay beyond the above specified period will be considered during LD calculation.	

Supplier Seal and Sign

(Vendor's Letter Head)

DECLARATION

In line with the Government Public Procurement, Order No. P-45021/2/2017-PP (BE-II) dated 28.05.2018, we hereby certify that we,

Supplier Name:,

with Vendor Code, are local supplier meeting requirement of minimum local content (.....%) defined in as above orders for the following items in Enquiry Serial Nos of BHEL Enquiry No:

- Mention quoted items Enquiry Serial Nos -

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

.....
.....

By issuing this declaration, we understand and are in acceptance to the following-

- False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.
- In case of debarment by any procuring entity for violation of the provisions of the Public Procurement (Preference to Make in India), Order 2017 we shall not be eligible for preference for procurement by any other procuring entity for the duration of the debarment. The debarment for such other procuring entities shall take effect prospectively from the date on which it comes to the notice of other procurement entities, the debarment takes effect prospectively from the date of uploading on the website(s) of The Department of Expenditure, GOI in such a manner that ongoing procurements are not disrupted.
- We undertake the onus of responsibility of submission of appropriately certified documents. We understand that BHEL is not at liability to verify the contents and will not be responsible for the declaration made by us. However, in case BHEL has any reason to doubt the authenticity of the local content, BHEL reserves the right to obtain the complete back up calculations before award of contract and we are liable to submit the same if requested by BHEL. We also understand that our bid is liable for rejection in case we fail to submit the details as requested by BHEL.

Date:

Seal and Signature of authorized signatory

INTEGRITY PACT**Between**

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____

_____. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions:

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
- 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and will await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to

demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

Section 5 - Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 - Equal treatment of all Bidders/ Contractors / Sub-contractors

- 6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain responsible for any default by his sub-contractors:
- 6.2 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 - Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
- 8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non- disclosure agreement.
- 8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

- 8.5 The role of IEMs is advisory, would not be legally binding and it is restricted to resolving issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter should be examined by the full panel of IEMs jointly as far as possible, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal/ administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.9 IEM should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the organization should be looked into by the CVO of the concerned organisation.
- 8.10 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code/ Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.
- 8.12 The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

- 9.1 This Pact shall be operative from the date IP is signed by both the parties till the final completion of contract for successful bidder and for all other bidders 6 months after the contract has been awarded. Issues like warranty / guarantee etc. should be outside the purview of IEMs.
- 9.2 If any claim is made/ lodged during currency of IP, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

- 10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

- 10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- 10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- 10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.


For & On behalf of the Principal

V. AVINASH
Sr. Engineer
(Office Seal) Purchase / Valves
BHEL, TRICHY - 620 014

For & On behalf of the Bidder/

Contractor

(Office Seal)

Place

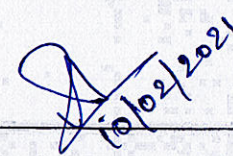
Trichy

Date

10/02/2021

Witness:

(Name & Address)


ARUN JOY
Sr. Engineer
Purchase / Valves
BHEL, TRICHY - 620 014

Witness:

(Name & Address)

BANK GUARANTEE FOR PERFORMANCE SECURITY

(Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s))

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

IFSC AND MICR CODE

Dear Sirs,

1. In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____¹ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) (VENDOR CODE) with its registered office at _____² hereinafter referred to as the ' Vendor / Contractor / Supplier ', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated³ valued at Rs.....⁴ (Rupees -----)/FC.....(in words.....) for⁵ (hereinafter called the 'Contract') and the Vendor / Contractor / Supplier having agreed to provide a Contract Performance Bank Guarantee, equivalent to% (... Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

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

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

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

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

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

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

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

9. This Guarantee shall remain in force upto and including.....⁷ and shall be extended from time to time for such period as may be desired by Employer.

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

11. Unless a demand or claim under this guarantee is made on us in writing on or before the⁸we shall be discharged from all liabilities under this guarantee thereafter.

12. Any claim or dispute arising under the terms of this document shall only be enforced or settled in the Courts at Tiruchirappalli.

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

Notwithstanding anything to the contrary contained hereinabove:

a) The liability of the Bank under this Guarantee shall not exceed.....⁶

- b) This Guarantee shall be valid up to⁷
- c) Unless the Bank is served a written claim or demand on or before (minimum 3 to 6 months from the expiry date)⁸ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

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

For and on behalf of
(Name of the Bank)

Dated.....

Place of Issue.....

BANK EMAIL ID:

BANK PHONE NO:

AUTHORISED SIGNATORIES CELL PHONE NO:

BANK FAX NO:

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

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

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ CONTRACT VALUE

⁵ PROJECT/SUPPLY DETAILS

⁶ BG AMOUNT IN FIGURES AND WORDS

⁷ VALIDITY DATE

⁸ DATE OF EXPIRY OF CLAIM PERIOD

List of BHEL's Consortium Bankers

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