



**Bharat Heavy Electricals Limited
Piping Centre Chennai-17**

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	1 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

**NTPC LIMITED –TELANGANA SUPER THERMAL POWER
PROJECT PHASE-1 (2X800 MW)**

CONTENTS

1.0		IMPORTANT NOTE TO THE BIDDER
2.0	SECTION I	INTENT OF SPECIFICATION
3.0	SECTION II	SCOPE OF WORK AND SUPPLY
4.0	SECTION III	GENERAL TECHNICAL REQUIREMENTS
4.0	SECTION IV	QUALITY ASSURANCE, INSPECTION & TESTING
6.0	SECTION V	SPARES & SPECIAL TOOLS
7.0	TABLE V-A	LIST OF SPARES
8.0	TABLE V-B	LIST OF SPECIAL TOOLS
9.0	TABLE V-C	LIST OF MANDATORY SPARES
10.0	SECTION VI	COMPLIANCE CERTIFICATE
11.0	SECTION VII	DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER
12.0	SECTION VIII	DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT
13.0	ANNEXURE-D	APPLICABLE QUALITY PLAN
14.0	ANNEXURE-E	SCHEDULE OF TECHNICAL DEVIATIONS

00	28.11.2017				
		Fresh Issue	PRABHAKARAN K	PRABHA R	PARAMESWARAN H
Rev	Date	Alteration	Prepared	Approved(C&I)	Approved (Mech.)



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	2 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

Important note to the Bidder

Bidder is to take Photostat copy of Table V-A & Table V-B, Section VI, Section VII and Section VIII of this specification, fill it by neatly typing and submit the same along with the offer. Non-compliance of the above shall lead to rejection of the offer. Information called for in the above tables, sections of the Technical specification furnished in any other format shall not be considered for evaluation.





**Bharat Heavy Electricals Limited
Piping Centre Chennai-17**

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	3 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

SECTION - I

INTENT OF SPECIFICATION

- 1.0 This specification is intended to cover the design, engineering, manufacture, shop fabrication, assembly, tests and inspection at vendor's and /or his sub-vendor's works, painting, packing and delivery to the specified destination of control valves for the mentioned project.
- 2.0 The equipment to be supplied as per this Technical specification shall be suitable for the site conditions specified in General Technical Requirements (Section III)
- 3.0 It is not the intent to completely specify herein all aspects of design and construction of equipment. Nevertheless the equipment shall conform to all aspects of high standards of engineering , design and workmanship and shall be capable of performing in continuous commercial operation in a manner acceptable to the Purchaser (BHEL) and Owner (NTPC) who will interpret the meaning of the specification, drawings and shall have right to accept or reject any work or material which in their assessment and judgement is not complete to meet the requirements of this specification and/or applicable national and/or international standards mentioned elsewhere in the specification.
- 4.0 The bidder may quote for his standard, proven design of equipment and shall submit stamped compliance certificate (enclosed in Section VI) confirming to all the specification requirements mentioned herewith.
- 5.0 The bids shall be in English language and follow MKS units.
- 6.0 The omission of specific reference to any component / accessory in the technical specification which is required for the proper performance of the equipment does not relieve the supplier the responsibility of providing such facilities to complete the supply within the quoted prices.



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	4 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

- 7.0 Purchaser (BHEL) / OWNER's (NTPC) representatives shall be given access to the shop in which the equipments are manufactured or tested and all test records shall be made available to them.
- 8.0 The equipment covered under this specification shall not be dispatched unless the same has been finally inspected, accepted and Material Dispatch Clearance Certificate (MDCC) is issued by Purchaser (BHEL) / OWNER (NTPC).
- 9.0 Bidders are suggested to raise any clarifications / deviations and get it duly resolved between BHEL and the Bidder before the submission of the techno-commercial offer. Bidder is requested to cooperate with BHEL for faster completion of the bidding process by avoiding as far as possible any technical deviations / clarifications along / after the submission of techno-commercial offer.





Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	5 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

SECTION - II

SCOPE OF WORK AND SUPPLY

1. BRIEF SYSTEM DESCRIPTION

Refer "Schematic Arrangement of Aux PRDS Station" attached with this specification (Drawing No 3-00-301-31358/R00)

Auxiliary steam system is designed to provide steam for the turbine auxiliaries, boiler auxiliaries during start-up, low loads and normal running of unit.

The system comprises of one "High capacity PRDS" with tapping from Main steam line to meet auxiliary steam requirements during unit Start-up, low loads and other "Low Capacity PRV" with tapping off steam from CRH line to meet auxiliary steam requirements during normal running. Spray water required for desuperheating will be tapped off from CEP discharge.

The HC PRDS will reduce the pressure and temperature of the steam tapped off from main steam line to 16 kg/sqcm(a) and 310 deg C. The LC PRV shall reduce the pressure of steam tapped from CRH line to 16 kg/sqcm(a) and temperature in range of 325 deg C to 368 deg C depending upon the CRH parameters at corresponding load.

2.0 SCOPE OF WORK

The scope of work of this specification shall include design, manufacture and delivery of control valves as detailed in various sections of this specification. Each control Valve shall be supplied with the accessories mentioned in the relevant data sheets



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	6 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

3.0 SCOPE OF SUPPLY

Sl No	Description	Tag No	Data Sheet No	Qty for Unit-1	Qty for Unit-2	Total Qty for Project
1	High Capacity Combined PRDS Valve	TAG No. ASV-22	4-00-306-41059/R00	1	1	2
2	Low Capacity Pressure Control Valve	TAG No. ASV-26	4-00-306-41060/R00	1	1	2
3	Common Spray Block Valve	TAG No. CDV-01	4-00-306-41061/R00	1	1	2
4	Spray Control Valve	TAG No. CDV-03 & CDV-06	4-00-306-41062/R00	2	2	4



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	7 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

SECTION III

GENERAL TECHNICAL REQUIREMENTS

1.0 CODES AND STANDARDS

- 1.1 The Control valves and accessories furnished by the bidder shall be designed, constructed and tested in accordance with the latest applicable requirements of code for power piping ASME B31.1, the ASME Boiler & Pressure vessel code, Indian Boiler Regulation (IBR), ISA, EN 60534 and other standards specified elsewhere as well as in accordance with all applicable requirements of the "Occupational Safety and Health Standards, USA" or acceptable equal standards.

2.0 DESIGN

- 2.1 The design of all valve bodies shall meet the specification requirements and shall conform to the requirements of ASME for dimensions, material thickness and material specification for their respective pressure classes.
- 2.2 The valve sizing shall be suitable for obtaining
- maximum flow conditions with valve openings at approximately 80% of total valve stem travel and
 - minimum flow conditions with valve stem travel not less than 10% of total valve stem travel.
 - All the valves shall be capable of handling at least 120% of the required maximum flow.
 - Further the valve stem travel range from minimum flow condition to maximum flow condition shall not be less than 50% of total valve stem travel.
 - The sizing shall be in accordance with the latest edition of ISA handbook on control valves.
 - While deciding the size of valves, Bidder shall ensure that valves trim exit outlet velocity as defined in ISA Handbook does not exceed



**Bharat Heavy Electricals Limited
Piping Centre Chennai-17**

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	8 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

- 8 m/sec for liquid service
- 150 m/sec for steam services and
- 50% of sonic velocity for flashing services.

Bidder shall furnish the sizing calculations clearly indicating the outlet velocity achieved with the valve size selected as well as noise calculations, which will be subject to Owner's (NTPC) approval during detailed engineering.

- 2.3 Control valves for steam and water applications shall be designed to prevent cavitation, wire drawing, flashing on the downstream side of valve and downstream piping. Thus for cavitation / flashing service, only valve with anti cavitation trim shall be provided. Detailed calculations to establish whether cavitation will occur or not for any given application shall be furnished.
- 2.4 The leakage class shall be as mentioned in the Data Sheets.
- 2.5 The control valve induced noise shall be limited to 85 dba at 1.0 meter from the valve surface under actual operating conditions. The noise abatement shall be achieved by valve body and trim design and not by use of silencers.
- 2.6 The characteristic of control valves shall be determined based on the application / service.

3.0 VALVE CONSTRUCTION

- 3.1 All control valves shall be of globe /angle body design as per data sheet with single port
- 3.2 Valves with high lift cage-guided plugs & quick-change trims shall be supplied.
- 3.3 Bidder to note that High Capacity PRDS is a combined type steam conditioning valve with single or dual class rating. Bidder to offer body and trim materials as per the datasheet. Wherever there is a deviation from the datasheets, bidder to furnish the documentary proof for confirming superior trim material/body material selection along with their offer. BHEL/NTPC reserves the right to accept/reject any variation in the specification.
- 3.4 Cast Iron valves are not acceptable.



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	9 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

- 3.5 Bonnet joints for all control valves shall be of flanged and bolted type or other construction acceptable to the owner. Bonnet joints of internal threaded or union type are not acceptable.
- 3.6 Plug shall be of one-piece construction either cast, forged or machined from solid bar stock. Plug shall be screwed and pinned to valve stems or shall be integral with the valve stems.
- 3.7 Valve characteristic shall match with the process characteristics.
- 3.8 Extension Bonnets shall be provided when the maximum temperature of following fluid is greater than 280° C

4.0 ACTUATORS

- 4.1 All control valves shall be furnished with pneumatic actuators. The Bidder shall be responsible for proper selection and sizing of valve actuators in accordance with the pressure drop and maximum shut off pressure and leakage class requirements. The valve actuators shall be capable of operating at 60° C continuously.
- 4.2 Valve actuators and stems shall be adequate to handle the unbalanced forces occurring under the specified flow conditions or the maximum differential pressure specified. An adequate allowance for stem force, at least 0.15 Kg/cm² per linear millimetre of seating surface, shall be provided in the selection of actuator to ensure tight seating unless otherwise specified.
- 4.3 The travel time for the actuators shall not exceed 10 seconds.

5.0 CONTROL VALVE ACCESSORY DEVICES

- 5.1 All pneumatic actuated control valve accessories such as air locks, hand wheels/hand-jacks, limit switches, microprocessor based electronic Positioner, diffusers, external volume chambers, position transmitters (capacitance or resistance type only), reversible pilot for Positioner, tubing and air sets, solenoid valves and junction boxes etc. shall be provided as per the requirements.



**Bharat Heavy Electricals Limited
Piping Centre Chennai-17**

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	10 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

6.0 SPECIFICATIONS FOR MICROPROCESSOR BASED ELECTRONIC POSITIONER

1	Electrical	a) Input Demand Signal	4-20 mA
		b) Power Supply	Loop Powered from the output card of Control System.
		c) HART Protocol	Compatibility for Remote Calibration & Diagnostics (Super-imposed HART signal on input Signal (4-20 mA))
		d) Valve Position Sensing	Position sensing, 4-20 mA output signal to be provided for control system.
2	Environment	a) Operating Temperature	(-)30 to 80 deg C
		b) Humidity	0-95 %
		c) Protection Class	IP-65 Minimum
3	* Software for Configuration and Diagnostics	Software *	Software shall meet the requirements of Configuration, diagnostics, calibration and testing of the actuator
		Diagnostic / Test features *	Advanced diagnostic features like Stroke Counter or Travel Counter, Leakage in actuators, Valve Signature analysis, Step response test, Valve friction / Jamming detection etc to be provided
4	Test Reports / Certificates	Factory Valve Signature Tests Reports (Pr vs Valve travel and Travel vs I/P Signal) are to be provided	
		Test Certificates as per Manufacturer's standard / Relevant Standard are to be submitted	
5	Configuration / Calibration	Remote and Local Calibration, Auto and Manual calibration shall be possible	
6	Operating Range	Full Range / Split Range	
7	Modes	Valve Action	Direct / Reverse Valve Action
		Flow Characterization	Possible to fit Valve Characteristic Curves – Linear / Equal percentage etc



**Bharat Heavy Electricals Limited
Piping Centre Chennai-17**

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	11 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

8	Fail Safe / Fail Freeze	Fail Safe / Fail Freeze feature is to be provided (In case the fail freeze feature is not intrinsic to the positioner, Bidder shall achieve the same externally through solenoid valve connected in the pneumatic circuit)	
9	Pneumatic	Air Capacity	Sufficient to handle the valves & actuators selected/ Boosters to be supplied, if required.
		Air Pressure	To suit the air supply pressure / quality available
		Process Connection	¼" NPT
10	Performance	Characteristic Deviation	<= 0.5% of span
		Ambient Temperature Effect	<= 0.01% / deg C or better
11	EMC and CE Compliance	Required to International Standard like EN / IEC	EN 50081-2 & EN 50082 or equivalent
12	Accessories	In built Operator Panel	Display with push buttons for configuration and display on the positioner itself (Password protected / Hardware lock)
		Hand held HART Calibrator *	Universal Hart Calibrator to be provided.
		Pressure Gauge Block	For supply & Output pressures, Air filter Regulator and other accessories shall be provided on as required basis for making system complete
		Electrical Cable Entry	½" NPT, side or bottom entry to avoid water ingress
		Valve mounting assembly	For sliding stem / rotary / single acting / Double acting actuators on as required basis

*** Note:**

The HAND held HART Calibrator and Diagnostic Software will be in the scope of BHEL. Bidder need not include the same in his scope of Supply

The HART signals shall be picked up from marshalling terminals of DDCMIS. The positioners shall be monitored from this HART management system. Contractor shall provide the necessary software to achieve the functionalities described above under "Software for Configuration and Diagnostics", and this software shall be loaded by the Contractor in his HART management system.



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	12 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

7.0 TESTING

- 7.1 All valves shall be tested in accordance with the requirements mentioned in Section IV of the Specification (Quality Assurance, Inspection and Testing) and the Tender Quality Plan furnished along with the specification in addition to the good practices followed by the Bidder.
- 7.2 Cv Testing: Cv Testing has to be carried out as per ISA 75.02 / EN60534-2-3 for each 10% of Rated Valve Travel from 0-100% of Rated Valve Travel. Any type of Computer Simulation / CFD in lieu of Cv Tests are not acceptable. Cv test has to be conducted in FCRI(India) / BHEL Approved Lab / Bidder's approved laboratory of repute. Cv Testing has to be carried out for each type (type means of same valve size, Cv and trim characteristics) of valves ordered for the first unit of the project if more than one unit is applicable. The Cv test reports will have to be submitted to BHEL / NTPC for approval prior to the final inspection by BHEL / NTPC.
- 7.3 Type Test Certificates: Type test Certificates for Cv test will be acceptable if Cv test has been carried out in the exact type (type means of same valve size, Cv and trim characteristics) as per ISA 75.02 / EN 60534-2-3 and results plotted as per above clause 7.2 within last ten years of bid opening. However in case the Contractor is not able to submit report of the type test(s) conducted within last Ten years from the date of bid opening, or in case the type test report(s) are found to be not meeting the specification requirements, the Contractor shall conduct all such tests in FCRI(India) / BHEL Approved Lab / Bidder's approved laboratory of repute in presence of Owner's representative without any extra cost and delivery implications and submit the reports for BHEL / NTPC approval.



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	13 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

8.0 NAME PLATE DETAILS

- 8.1 Name plate shall be of engraved chromium plate or label with engraving filled with enamel. Nameplate data shall be inscribed on the plate in such a manner that it cannot erode or peel off. Name Plate inscriptions shall be in English.
- 8.2 Name plate shall be marked in accordance with MSS standard SP-25 and ASME B16.34 as a minimum.
- 8.3 Valves shall be identified by owner's tag no. on a metal tag permanently attached to a non-pressure part, such as the yoke by a stainless steel wire.
- 8.4 All exposed steel surfaces are to be painted before despatch as per technical requirements.

9.0 PACKING

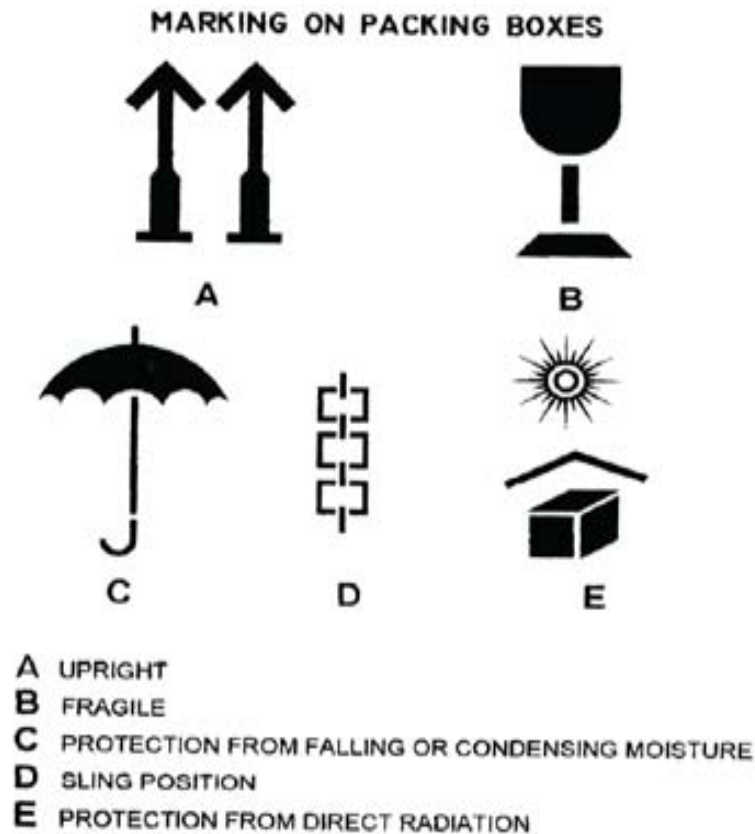
- After inspection of control valves assembly, Smart Positioner along with Pressure Gauge shall be disassembled & packed separately.
- Threaded connection of Smart Positioner & Pressure Gauge shall be shipped with the end caps fitted to avoid any damage.
- Instructions with sketch for mounting the Smart Positioner & Pressure Gauge shall be sent along with the aforesaid accessories.
- Packing of the control valves and Smart Positioner along with Pressure Gauge shall be done in separate wooden boxes/cases in order to avoid damage during transit and also during storage at site in tropical climatic conditions for a period of 18-24 months.
- All valves & smart positioner along with pressure gauges shall be packed properly with quality wooden planks with proper wooden frame support. Moreover the valves are to be internally covered with polythene sheets to protect from the water and moisture entry.
- Stronger shock absorbing cover material like expanded Polyurethane which can take any direct impact on it shall be used for packing
- Proper reaper supports to be provided in the packing and Valve assembly to be aligned properly to avoid the damage of accessories during transit due to vibration effect.
- Marking for Fragile & Condensing environment shall be done on the packing box



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	14 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES



The Following Details are to be marked on the Packing Cases

- Address of consignee
- Purchase order no.
- Description of items or title of packing list
- Weight
- Dimension of the Box
- Marking showing upright position
- Marking showing sling position
- Marking showing umbrella (i.e. for machines/components to be stored under covered storage)

The following additional packing requirements will be applicable for MANDATORY SPARES



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	15 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

- Mandatory spares shall be despatched only in distinct boxes / containers / crates and not supplied in loose.
- All boxes/containers / crates are to be distinctly marked **"S - PC "** in **Red color** on each face of the containers / secure boxes to distinctly identify the items as Mandatory Spares.
- The containers/secure boxes/ crates should contain only Mandatory Spares and no other items which may form
- The box pack slip shall contain the item list with BBU Sl. No. and PGMA –DU.
- The despatch documents like LR/LWB / Excise Invoice/ Delivery challan /Box Pack slip etc., shall be made exclusively for the Mandatory Spares being despatched.





**Bharat Heavy Electricals Limited
Piping Centre Chennai-17**

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	16 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

SECTION IV

QUALITY ASSURANCE, INSPECTION AND TESTING

1.0 GENERAL

- 1.1 All equipment covered under this specification shall be subject to inspection and test by the purchaser during manufacture, erection and commissioning. The approval of the purchaser of the results of the tests and inspection will not however, prejudice the right of the owner to reject the equipment if it does not comply with the specification when erected or does not give complete satisfactory service. The cost of all such tests shall be borne by the contractor.
- 1.2 Testing / Inspection procedures mentioned in BHEL's Tender Quality Plan and detailed herein is to give a basic quality control programme to be followed by the Bidder, and are in no way comprehensive nor form a complete quality assurance programme. Any other inspection stage not mentioned in these clauses but required as per the Bidder's process control shall be deemed to be included. Any tests necessary from operation, safety and reliability point of view shall also be included. Such tests shall be subject to the approval / recommendation of the Purchaser.

2.0 SHOP TESTS

- 2.1 The contractor shall permit the Purchaser, if he so desires to maintain one or more of his representatives in the Contractor's shops and/or at the shops of his sub-contractors for the purpose of inspecting the various steps in the shop fabrication and the various tests to be performed for the materials supplied under this specification. The Purchaser's representative(s) shall have complete access to all parts of the shop wherein work under this specification is to be performed.



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	17 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

- 2.2 The contractor shall adopt good quality control procedures and provide inspection in his works and that of his sub-contractors to ensure the mechanical accuracy of components, compliance with drawings, identify and acceptability of all material, part and equipment. He shall conduct all tests required to ensure that the equipment furnished conforms to the requirements of the applicable codes. All tests and test procedures proposed by the manufacturer/fabricator shall be submitted to the purchaser for his prior approval. The purchaser shall be notified well in advance of the fabrication and major tests of the appurtenances and equipment, for the purpose of making general inspections and progress reports.
- 2.3 The Purchaser's representative shall have full access to the shops where the equipment to be supplied is being tested and all test records including records on heat treatment, radiography, ultrasonic test, magnetic particle test, material analyses etc. shall be made available to him. When the contractor offers finished equipment for final inspection, notice of at least 15 days shall be given to the purchaser to enable his inspector to plan and carry out the inspection.
- 2.4 No material shall be despatched to the site from the manufacturers works until the owner has arranged for and carried out inspection to his satisfaction or has waived this requirement in writing.
- 3.0 PRODUCT TESTING AND INSPECTION**
- 3.1 The testing (including material, NDE, functional and Cv test) and inspection of the equipment / items shall be in line with the Quality Assurance Plan approved by Customer (NTPC)/ Purchaser (BHEL) during Contract stage
- 3.2 Detailed quality plan shall be submitted by the successful bidder after the placement of order for for final approval by BHEL / NTPC. BHEL / NTPC shall indicate Customer Hold Points (CHP) in the approved Quality Plan beyond which work shall not proceed without the approval of BHEL / NTPC for the project during final execution.

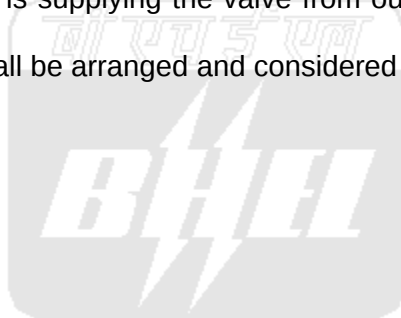


Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	18 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

- 3.3 The quality plans enclosed along with this specification are for bidder's guidance only and are not exhaustive. The bidder shall comply with these and other minimum requirements specified in the specification and shall furnish his own quality plan in BHEL/NTPC formats in the event of order based on the guidance given as above for BHEL/NTPC approval.
- 3.4 The cost of all tests as per the approved Quality Plan will be deemed to have been included in the bid. All the testing requirements have been covered in the Tender Quality Plan, however any additional requirements insisted by Customer (NTPC) during Contract stage will have to be carried out by the bidder without any delivery and commercial implications
- 3.5 In case, the bidder is supplying the valve from outside India, the third party inspection including IBR certification shall be arranged and considered by the bidder in their offer.





**Bharat Heavy Electricals Limited
Piping Centre Chennai-17**

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	19 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

SECTION V

SPARES AND SPECIAL TOOLS

1.0 COMMISSIONING SPARES

Commissioning spares are those spares, which may be required during start up, and commissioning of the unit. Bidder must quote for these spares and unit prices to be indicated.

2.0 RECOMMENDED SPARES

Recommended spares for all the items for three-year operation. Bidder must quote unit price. Bidder shall indicate the shelf life for gaskets, packing etc. The recommended spares list shall be independent of the list of mandatory spares. The purchaser (BHEL) reserves the right to buy any or all of the recommended spare parts.

3.0 MANDATORY SPARES

Mandatory spares are those spares, which are considered essential by the BHEL / NTPC for Normal operation of the plant. Bidder to indicate the Unit Price for each and every item in the schedule of mandatory spares whether or not the Bidder considers it necessary for the purchaser to have it.

3.1 Bidder shall identify the Commissioning spares, Recommended spares and Mandatory Spares in the cross sectional drawing or in the catalogue for easy reference.

3.2 All spares supplied under this contract shall be strictly interchangeable with the parts for which they are intended for replacements.

3.3 All spare parts furnished shall be new and unused. The contractor shall guarantee that in the event of any of the spares offered goes out of production notice shall be given to the owner sufficiently in advance to enable him to order this requirement of spares in one lot, if the owner so desires.



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	20 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

- 3.4 Bidder shall indicate the service expectancy period for the spare parts under normal operating conditions before the replacement is necessary.
- 3.5 Complete manufacturing drawings of items shall be given to the owner as and when any spare parts are discontinued from manufacturing.
- 3.6 Bidder shall furnish the list of recommended spares as per format in Table V-A.
- 3.7 Requirement of Mandatory Spares are indicated in Table V-C.

4.0 SPECIAL TOOLS AND TACKLES

Bidder shall quote separately the special tools if any required for erection, commissioning and maintenance of the equipment if the bidder considers it as essential whether or not the requirement of such tools are indicated in this specification. However, if the requirements of such tools are indicated, bidder shall indicate the price for each and every item of the special tools indicated. If the bidder fails to comply with the above or fails to quote the price of special tools indicated, the cost of such special tools shall be deemed to be included in the contract price. All tools shall be new and unused.

Bidder shall furnish the list of special tools required as per the Table V-B



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	21 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

TABLE V-A

LIST OF SPARES
(To be filled in by the bidder)

Sl. no	Description of spare	Reference Drawing.	Item no.	Qty. reqd For commissioning Spare.	Qty. reqd For Recommended Spare.	COST / No

Signature of the bidder.



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	22 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

TABLE V-B

LIST OF SPECIAL TOOLS
(To be filled in by the bidder)

Sl. no	Description of the tool	Reference Drawing.	Item no.	Quantity	COST / No

Signature of the bidder



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	23 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

TABLE-V-C
MANDATORY SPARES

Note : The requirement furnished below is for two units (for total project) and hence need not be doubled. Vendor to work out quantity of spare as per logic specified by customer in the below table. Duplicate items should not be quoted as mandatory spare.

Auxiliary Steam Pressure Reducing & Desuperheating System		
High Capacity PRDS System (i.e for ASV-22)		
1	Complete PRDS Valve	2 nos
2	Stem	2 nos.
3	Disc	2 no.
4	Body seat rings	4 nos. for each type, size and rating of valves
5	Gland packings	4 nos. for each type, size and rating of valves
6	Pressure Seal Ring	4 nos.
7	Gasket	4 nos.

Low Capacity PRDS System (i.e for ASV-26)		
1	Complete Pressure Reducing Valve	2 nos
2	Stem	2 nos.
3	Disc	2 nos.
4	Body seat rings	2 nos. for each type/size
5	Gland packings	4 nos. for each type, size and rating of valves
6	Pressure Seal Ring	4 nos.
7	Gasket	2 nos.

CONTROL VALVES, ACTUATORS & ACCESSORIES

(Following items shall be provided under this clause for all modulating control valves being supplied under this package even if one or more of these items are also specified elsewhere under mandatory spares)

1	Pneumatic and electro-hydraulic actuator assembly	10% or 1 no. of each type, model and rating, whichever is more.
2	Valve trim (including cage, plug, stem, seat rings, guide bushings etc.)	1 set for each type of control valve.
3	Diaphragms, O' rings, seals etc. of all types make etc.	100%
4	Pressure Gauges of all types, make, rating etc.	10% or 2 nos. of each type whichever is more
5	Solenoid valves (if applicable)	10% or 2 nos. of each type whichever is more
6	Positioner units (complete unit) & accessories (link assembly)	10% or 1 no. of each type whichever is more
7	Pneumatic air-filter/Regulator of each type, make rating etc.	10% or 2 Nos., whichever is more
8	Air lock relays	10% or 2 nos. of each type whichever is more



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	24 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

SECTION VI

COMPLIANCE CERTIFICATE

The bidder shall confirm compliance with following by signing/ stamping this compliance certificate and furnish the same with the offer.

- 1) The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions with regard to same.
- 2) There are no other deviations w.r.t. specification, other than those indicated in the "Schedule of Technical deviations / Clarifications" - Annexure E of this technical specification. Any deviation, stated or implied, taken elsewhere in the offer stands withdrawn. The acceptance of such deviations is not binding on BHEL/ NTPC.
- 3) Bidder shall submit stamped Quality Plan on compliance basis in the event of order based on the guidelines given in the specification. In case, the bidder is supplying the item from outside India, the third party inspection including IBR certification shall be arranged and considered by the bidder in their offer.
- 4) Any drawing/ document/ data-sheet/ calculation/ Quality plan/ Instrumentation etc. submitted along with the offer shall be considered for reference only, same shall be subject to BHEL/ NTPC approval in the event of order.
- 5) The offered materials shall be either equivalent or superior to those specified in the specification. For components where materials are not specified, same shall be suitable for intended duty, all materials shall be subject to approval in the event of order.
- 6) Bidder to confirm that any calculation/format required during the contract (in the event of order) to ascertain any calculated/selected value/ testing report shall be furnished.
- 7) Selection of valves and actuators are bidder's responsibility. Any change in selection of type of valve / sizing / percentage opening, calculations, Quality Plan, etc., if desired by BHEL / NTPC during approval of the documents after award of contract, without major changes in process parameters as per tender specification, shall be carried out by bidder without any commercial implication and time delay.
- 8) All sub - vendors shall be subject to BHEL/ NTPC approval in the event of order.

Certified that all the above requirements complied with

(Signature of Bidder)



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	25 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

SECTION VII

DOCUMENTS TO BE FURNISHED ALONG WITH THE OFFER

- Note:
- a) All documents shall be in ENGLISH language only
 - b) Only units followed in this specification are to be used.

Sl No	Description	To be filled by the Bidder. Bidder's drawing or document reference (if not furnished "NOT FURNISHED" with reason
1.0	General arrangement drawing of the valves with actuators indicating overall dimensions for layout with technical information like Model, Size, Material of construction of important components , weight of valve actuator assembly	
2.0	Product Catalogue of Valves being offered	
3.0	Sizing calculations / Data sheets for each valve quoted .	
4.0	Hook up diagram of Control Valves and Accessories	
4.0	Quality Plan of BHEL duly signed and stamped for acceptance	
5.0	Vendor list of Critical Components like Forgings, Castings and Actuators.	
6.0	ISO 9001 Certificate with current validity	
7.0	Compliance Certificate duly signed and Stamped	



Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC:TSP:APRDS/TELANGANA	00	26 of 26

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

SECTION VIII
DOCUMENTS TO BE FURNISHED AFTER AWARD OF CONTRACT

- Note:
- All documents shall be in ENGLISH language only
 - Only units followed in this specification are to be used.
 - All documents shall contain the project name and applicable valve tag nos.

Sl. No	DESCRIPTION	No of Days reqd. to submit for approval after LOA/TOA or to resubmit for approval after BHEL comments
1	DATA SHEET FOR EACH CONTROL VALVE	15
2	CALCULATION SHEET FOR EACH CONTROL VALVE	15
3	GENERAL ARRANGEMENT DRAWING	15
4	CROSS SECTIONAL DRAWING WITH MOC	15
5	MANDATORY SPARE ITEMS MARKED IN CROSS SECTION	15
6	HOOK UP DIAGRAM	15
7	JUNCTION BOX WIRING DIAGRAM	15
8	APPLICABLE CATALOGUE OF VALVE	15
9	CATALOGUE OF EACH VALVE ACCESSORIES (ACTUATORS, PRESSURE GAUGE, SOLENOID VALVE, AIR FILTER REGULATOR, SMART POSITIONER, AIR LOCK RELAY, VOLUME BOOSTER ETC.)	15
10	TEST CERTIFICATE AS INDICATED IN APPROVED QUALITY PLAN.	Bidder will be informed of the schedule during Contract Stage
11	IBR AND OTHER MANDATORY REQUIREMENTS IF REQUIRED	Bidder will be informed of the schedule during Contract Stage
12	ERECTION, COMMISSIONING, OPERATING AND MAINTENANCE MANUAL CONTAINING MINIMUM OF THE FOLLOWING DETAIL. A. GA and Cross sectional drawing. B. Actuator data sheet and wiring diagram of actuator. C. Do's and Do not's for valves & actuators D. Erection procedure and precautions to be taken E. Commissioning procedure and precautions to be taken F. Operating and maintenance instructions.	Bidder will be informed of the schedule during Contract Stage

Certified that the drawings / documents will be submitted / furnished as per the above Table.

(Signature of the Bidder)