



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

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**TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES**

**NTPC-GADARWARA STPP (2X800 MW)  
STAGE-I (UNIT 1 & 2)**

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Rev	Date	Alteration	Prepared	Approved(C&I)	Approved (Mech.)



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Important note to the Bidder

Bidder is to take Photostat copy of Table V-A & Table V-B, control valve data sheets, 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 be considered only for information.





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**SECTION - I**  
**INTENT OF SPECIFICATION**

- 1.0 This specification is intended to cover the design, engineering, manufacture, shop Fabrication, assembly, tests and inspection at manufacturer's works, packing and despatch 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 Equipment specification (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 who will interpret the meaning of the specification, drawings and shall have right to accept or reject any work or material which in his assessment 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 If any provision of this specification departs from the bidder's usual construction sufficiently to materially increase cost of equipment without (in bidders opinion) providing a corresponding increase in quality or if the bidder considers that his usual construction would provide better quality, the Bidder shall call this to the attention of the Purchaser by submitting an alternate bid. However in any case, a base bid shall be submitted based on the equipment and services as specified.



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**SECTION - II**

**SCOPE OF WORK AND SUPPLY**

**1.0 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.

**2.0 SCOPE OF SUPPLY**

- |  |                       |
|--|-----------------------|
| 1. High Capacity Combined PRDS Valve   | TAG No. AS-22         |
| 2. Low Capacity Pressure Control Valve | TAG No. AS-26         |
| 3. Common Spray Block Valve            | TAG No. FD-43         |
| 4. High Capacity Spray Control Valve   | TAG No. FD-45 & FD-48 |
| 5. Low Capacity Spray Control Valve    | TAG No. FD-52 & FD-55 |
| 6. LT Desuperheater                    | TAG No. DESH-1        |
| 7. LC Spray Temperature Control Valve  | TAG No. CDV-93        |
| 8. Turbine Gland Seal Desuperheater    | TAG No. DESH-2        |

Complete accessories such as pneumatic diaphragm actuators, smart positioners, air lock valve, limit switches, air-set (air filter with regulators and gauges), solenoid valves, junction box and hand wheel for all control valves. All accessories shall be mounted integrally, tubed and supplied.



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**SECTION - III**

**EQUIPMENT SPECIFICATION**

1	High Capacity Combined PRDS Valve TAG No. AS-22	4-00-306-40442/R00 (3 SHEETS)
2	Low Capacity Pressure Control Valve TAG No. AS-26	4-00-306-40443/R00 (3 SHEETS)
3	Common Spray Block Valve TAG No. FD-43	4-00-306-40444/R00 (3 SHEETS)
4	High Capacity Spray CV TAG No. FD-45, FD-48	4-00-306-40441/R00 (3 SHEETS)
5	Low Capacity Spray CV TAG No. FD-52, FD-55	4-00-306-40440/R00 (3 SHEETS)
6	LT Desuperheater TAG No.DESH-1	4-00-306-40445/R00 (1 SHEET)
7	Schematic Arrangement of Aux. PRDS station	3-00-301-31301/R00 (1 SHEET)
8	LC Spray Temperature CV TAG No. CDV-93	4-00-306-40583/R00 (3 SHEETS)
9	Turbine Gland Seal Desuperheater TAG No.DESH-2	4-00-306-40584/R00 (1 SHEET)
10	Turbine Gland Seal Desuperheater Scheme	4-00-306-40585/R00 (1 SHEET)



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**Section IV**

**General Technical Requirements**

- 1.0 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, and other standards specified elsewhere as well as in accordance with all applicable requirements of the "Federal Occupational Safety and Health Standards, USA" or acceptable equal standards.
- 2.0 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.
- 3.0 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 velocity at valve outlet does not exceed 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 by him as well as noise calculations, which will be subject to Owner's approval during detailed engineering.



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- 4.0 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.
- 5.0 Control valves for spray water application shall have leakage rate as per leakage class V. All other control valves shall have leakage rate as per leakage class IV
- 6.0 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.
- 7.0 The characteristic of control valves shall be determined based on the application / service.
- 8.0 **Valve construction:**
- 8.1 All valves shall be of globe body design & straightway pattern with single or double port, unless otherwise specified or recommended by the manufacturer to be of angle body type. Rotary valve may alternatively be offered when pressure and temp. drops permit.
- 8.2 Valves with high lift cage-guided plugs & quick-change trims shall be supplied.
- 8.3 Cast Iron valves are not acceptable.
- 8.4 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.



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- 8.5 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.
- 8.6 All valves connected to vacuum on down stream side shall be provided with packing suitable for vacuum application (e.g Double Vee type chevron packing)
- 8.7 Valve characteristic shall match with the process characteristics.
- 8.8 Extension Bonnets shall be provided when the maximum temperature of following fluid is greater than 280° C
- 8.9 Flanged valves shall be rated at no less than ASME pressure class of 300 lbs.

**9.0 Valve Actuators:**

- 9.1 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.
- 9.2 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/cm<sup>2</sup> per linear millimetre of seating surface, shall be provided in the selection of actuator to ensure tight seating unless otherwise specified.
- 9.3 The travel time for the actuators shall not exceed 10 seconds.

**10.0 Control valve Accessory Devices:**

- 10.1 All control valve accessories such air locks, hand wheels / hand-jacks, Torque switches, smart positioners, solenoid valves, diffusers, external volume chambers, tubing and air sets and junction boxes etc. Shall be provided as per requirements.



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**11.0 NAME PLATE:**

- 11.1 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 bilingual in Hindi followed by English. Alternatively two separate plates one with Hindi and other with English inscriptions may be provided.
- 11.2 Name plate shall be marked in accordance with MSS standard SP-25 and ASME B16.34 as a minimum.
- 11.3 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.
- 11.4 All exposed steel surfaces are to be painted before despatch as per technical requirements.



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**Section V**

**Spares & 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 prices. 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 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 purchaser for Normal operation of the plant. If such spares are indicated, bidder shall indicate the 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. If the bidder fails to comply With the above or fails to quote the price of any mandatory spares the cost of such Spares shall be deemed to be included in the contract price.



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- 4.0 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.
- 5.0 Bidder shall identify the Commissioning spares, Recommended spares and Mandatory Spares in the cross sectional drawing or in the catalogue for easy reference.
- 6.0 All spares supplied under this contract shall be strictly interchangeable with the parts for which they are intended for replacements. The spares shall be treated and packed for long storage under the climatic conditions prevailing at the site. eg. Small Items shall be packed in sealed transparent plastic bags with dissector packs as necessary.
- 7.0 Each spare shall be clearly marked or labelled on the outside of the packing with its description. When more than one spare part is packed in a single case a general description of the contents shall be indicated on the outside of such cases and a detailed list enclosed. All cases, containers and other package must be suitably marked and numbered for the purpose of identification.

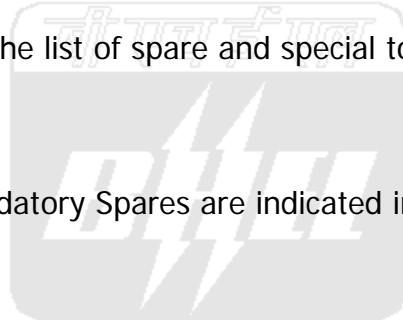


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- 8.0 All spare parts furnished shall be new and unused. The contractor shall guarantee that in the event of any of the spares offered goes out of production notice shall be given to the owner sufficiently in advance to enable him to order this requirement of spares in one lot, if he so desires.
- 9.0 Bidder shall indicate the service expectancy period for the spare parts under normal operating conditions before the replacement is necessary.
- 10.0 Complete manufacturing drawings of items shall be given to the owner as and when any spare parts is discontinued from manufacturing.
- 11.0 Bidder shall furnish the list of spare and special tools required as per the Table V-A and V-B.
- 12.0 Requirement of Mandatory Spares are indicated in Table V-C.





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**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.	Qty. reqd For mandatory Spare.	COST / No

Signature of the bidder.



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**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.



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**TABLE-V-C  
MANDATORY SPARES**

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.

S No.	Description	Qty	Unit
1.	<u>High Capacity PRDS system</u>		
1.0	Desuperheater Liner	1	Set
1.1	i. Steam Pressure reducing cum desuperheating valves ii. Stem iii. Disc iv. Body seat rings v. Gland packing vi. Pressure seal ring vii. Gasket	1 1 1 2 for each type, size and rating of valves 2 for each type, size and rating of valves 2 2	No. No. No. No. No. No. No.
1.2	<u>High capacity spray water line control valves.</u> Valve trim including cage, plug, stem, seat rings, guide bushings, stem packing	1 for each type, size and rating of valves	No.
2.	<u>Low capacity PRDS system (CRH)</u>		
	i. Steam pressure reducing valve ii. Stem iii. Disc iv. Body seat rings v. Gland packing vi. Pressure seal ring vii. Gasket	1 1 1 2 for each type, size and rating of valve 2 for each type, size and rating of valve 3 2	No. No. No. No. No. No. No.
2.2	<u>Low capacity spray water line control valves.</u> Valve trim including cage, plug, stem, seat rings, guide bushings, stem packing	1 for each type, size and rating of valve	No.



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**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 as detailed herein to give a basic quality control programme to be followed by the Bidder, are in no way comprehensive and in no way 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.

1.3 The Bidder shall furnish the quality control procedures to be adopted for assuring quality of each equipment under this specification from the receipt of material at site, during storage, erection, pre-commissioning to final trial run and commissioning of the valves. These procedures shall necessarily include all checks / tests conducted at site for preservation, pre-assembly, alignment, positioning of equipment, foundation preparation, welding / bolting, heat



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treatment, non-destructive examination, hydraulic test, performance test etc. The above shall be discussed and finalised with 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.

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



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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.

2.5 Material test and analysis:

All materials shall be furnished in strict accordance with the applicable codes and the detailed specifications herein. All sources of material shall be disclosed and relevant test certificates giving precise details of identification of material, the physical and chemical properties of the material shall be submitted to the owner for approval. Test coupons shall be cast from the same melt for the body & disc.

2.6 Shell Test:-

All valves shall be subjected to shell test as per ANSI B16.34 and MSS-SP-61. All gaskets used for test shall be of the same material and design as specified for the finished products. Where mechanical gasket joints are broken following tests, new gaskets shall be fitted with the equipment and the joints shall be re-tested.

2.7 100% visual check shall be carried out for dimensions, end connection details and Surface finish of the equipment.

2.8 The complete inspection shall be carried out as per the owner's quality plan.

2.9 The inspection shall be carried out as per the drawing approved by the purchaser



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**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 operators and other special accessories indicating clearly  a) overall dimensions, b) Weight of valve, actuator & special accessories, c) Model no. d) Make & country of Manufacture, e) Rating/Design code f) Type g) End connection details h) Type of operator i) Make of operator and Model No. j) Valve Tag nos.	
2.0	Cross sectional drawing of the valve with operators and special accessories indicating minimum the following:	



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3.0	<p>i) Names of all parts</p> <p>ii) Material of construction of all parts(Material specification shall not be in general terms like carbon steel, Alloy steel etc. Material specification shall conform to International standards. In case of Material specification other than ASTM, equivalent ASTM material specification to be indicated. No part of the valve to be left in the Tabulation).</p> <p>Minimum the following parts to be covered if applicable.</p> <ul style="list-style-type: none"><li>a) Body</li><li>b) Bonnet, Cap</li><li>c) Disc</li><li>d) Stem</li><li>e) Plug</li><li>f) Disc seat</li><li>g) Stem guide</li><li>h) Gasket</li><li>i) Gland packing</li><li>j) Bolts &amp; studs</li><li>k) Nuts</li></ul>	
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	<p>i) Hand wheel</p> <p>iii) Weight of all parts</p> <p>iv) Erection, commissioning and Mandatory Spares identification along with their Quantity.</p> <p>v) Weight of valve &amp; actuator separately Total weight and flooded weight</p> <p>vi) Class rating as per ASME B16.34</p> <p>vii) Make &amp; Country of Manufacture</p> <p>viii) Actuator Make &amp; Type</p> <p>ix) End connection details</p>	
4.0	Relevant catalogues for the valves	
5.0	List of Tender deviations (It will be presumed that the bidder has no tender deviations in case bidder failing to furnish the same).	



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Certified that all the information called for is available in the document or drawing indicated above.

Certified that our supply of valves will be in line with the Technical specification except the deviations furnished in Table IIIA and in the list of Tender deviations enclosed if any.

(signature of the bidder).





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**SECTION VIII**

**Documents to be furnished after award of the contract**

- Note:
- a) All documents shall be in ENGLISH language only
  - b) Only units followed in this specification are to be used.
  - c) All documents shall contain the project name
  - d) Applicable valve tag nos.

Sl.no	Description	Ref. Drawing	No of days reqd. To submit for approval after LOA / TOA or to resubmit for approval after BHEL comments.	No. of copies to be sent for approval.	No of days to furnish final drg after final approval.	No of copies to be furnished after final approval.
1.0	General arrangement drawing as per point 1 , section VII.		15	5	5	15
2.0	Cross sectional drawing as per point 2 , section VII		15	5	5	15
3.0	Applicable catalogue of valve.		15	5	5	15
4.0	Erection, commissioning, operation and maintenance Manuel containing minimum of the following detail.		LATER	5	5	15



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	1) General arrgt. & cross sectional arrgt. Drgs as per point 1&2 of section VII respectively		15	5	5	15
	2) Actuator data sheet and wiring diagram of actuators.					
	3) List of Ball & Roller bearing schedule.					
	4) List of lubrication oil schedule					
	5) Do's and Do not's for valves & actuators.					
	6) Erection procedure & precautions to be taken.					
	7) Commissioning procedure & precautions to be taken.					
	8) Operating & maintenance instructions.					
5.0	Test certificates.		Not Applicable.	Nil	45	15
	1) Raw material test certificates (chemical & mechanical)					
	2) Hydro test certificates.					



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**TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES**

	3) Seat test certificates					
	4) Back seat test certificates					
	5) NDT & other test certificates as per ASME B 31.1					
6.0	IBR and other mandatory requirements if required.		Not Applicable	Nil	45	15
7.0	Drawings in sl no: 1.0 & 2.0 recorded in CD		Not Applicable	Nil	60	15

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

(Signature of the Bidder)

CI 12/A



# CONTROL VALVE SPECIFICATION SHEET

( IN ACCORDANCE WITH I.S.A. FORM S20.51 )

PROJECT:

NTPC-GADARWARA STPP STAGE-I (2x800MW)

CUST.No: 7216, 7217

**GENERAL: THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION** PC: TSP: APRDS

- 1. Valve tag No. AS-22
- 2. Service : High capacity combined PRDS valve
- 3. Line No./Vessel No. :
- 4. Qty. required per unit : ONE

- 5. Manufacturer : \*
- 6. Model No. : \*
- 7. Rating : ASME CL. 3000 Spl.
- 8. Total Qty Required : 2 No.

**BODY:**

- 9. Type : Thru  3 Way   
Z type  Angle
- 10. Form : Globe  Ball   
Butterfly
- 11. Size : \*
- 12. Port Size : \*
- 13. Connecting Pipe size : Steam Inlet : OD 219.1 x 34  
Steam Outlet : OD 610 x 25  
Spray inlet : OD 88.9 x 15.24
- 14. Body rating : ASME CL. 3000 Spl.

- 16. Bonnet type : Standard  Finned   
Extended  Pr. seal
- 17. Material : Body : ASTM SA182F91  
Packing: GRAFOIL  
Bolting : \*
- 18. Flow direction : SIDE ENTRY-BOTTOM EXIT
- 19. Suitable matching pieces to match with pipe size specified shall be offered.

- 15. Type of end connections : Screwed  BW  (Steam and spray side) SW   
NPI  BSPT  BS   
Flanged   
ANSI  DIN

Edge Preparation as per BPS.

**TRIM:**

- 20. No. of ports : \*
- 21. Type : Balanced  Unbalanced
- 22. Plug characteristics: ~~L/LV/EP~~ / ~~MODIFIED EP~~
- 23. Guiding : Cage  Port  Top   
Bottom

- 24. Stem material : }
- 25. Plug material : }
- 26. Seat material : } SS316 OR EQUIVALENT
- 27. Disc material : }
- 28. stem guide material : }
- 29. Cage Material : F22 Ion Nitrided (or) Better

**ACTUATOR:**

- 30. Type : Electric  Pneumatic   
Hydraulic  DA/RA (Air To Close)
- 31. Size : \*
- 32. Supply : 45 PSIG
- 33. Failsafe position : Stayput   
of valve. Full Close  Full Open

- 34. Diaphragm/Cylinder pressure at Valve full open : \*  
Valve full close :
- 35. Force required for process & Force available at actuator. : \*
- 36. Actuator sizing ΔP : \*
- 37. If actuator electric fill in data sheet as per annexure : NAPL  
furnished and shall comply with annexure-I specification.

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NTPC DOC NO.	9572-102-PC-PVI-Y-027
DRG. NO:	4-00-306-40442
26	00

**POSITIONER:**

38. Type : Pneumatic  Electronic   
 DA/RA Electro Pneumatic   
 (SMART WITH FAIL FREEZE FACILITY)  
 39. If Electronic : Type :  
 Model : Solid plate deversing contactors  
 Main contactor : Solid state thyristor:   
 Relay Switching :   
 Also refer annexure - II  
 position indicator reqd. for Valve & VCB

40. If Pneumatic : Type :  
 Model : \*  
 Split range : Yes  No   
 Controller Input & Output Signal Value } : 4-20 mA  
 Air supply : 45 PSIG  
 Input/Output Pr. guage :  
 Required : Yes  No   
 By pass provision : Yes  No   
 Action : Direct  Reverse  Both   
 Cam : =%  Linear  Both

**ACCESSORIES:**

41. Handwheel : Yes  Side  Top   
 42. Air filter : Yes  No   
 Filter Size : 5 Micron  25 Micron   
 43. Limit Switches : Yes  No   
 Qty. : 1 at full open & 1 at full close  
 Rating : 240v. 5Amp. ac  
 No of contacts per switch : 2No + 2NC  
 44. Solenoid valve to effect  
 Stayput : Yes  No   
 Type : 3 Way universal: Yes  No   
 Rating : 24V DC 2 wire  
 Class H coil : Yes  No   
 45. Vol. booster : Yes  No   
 46. Travel time : \*  
 47. Installation : Indoor  Outdoor   
 48. All accessories enclosure : \*

49. Isolated Position transmitter : Yes  No   
 Type : Pneumatic :  Electronic Non contact type   
 Rating : 2 wire 24V DC:   
 Output : 4-20 ma :  3-15 paig   
 50. Torque Switches : Yes  No   
 Qty. :  
 Rating :  
 51. Air lock : Yes  No   
 Function : TO EFFECT STAYPUT  
 Type \* : 3 Way single acting   
 : 3 Way double acting   
 52. Ambience : Dusty corrosive   
 Toxic hazardous :   
 53.1. Local position Indicator: Required.  
 53.3 Integral JB : 36 Way JB required  
 53.4 All electrical terminating : plug & socket type

**MISCELLANEOUS:**

54. Seat leakage : FCI 70.2 class  CLASS IV  
 I.S.A :    
 55. Approx. weight (total) : \*  
 56. Space requirements for online servicing : \*

57. Valve sizing as per ISA 75.01 : Yes  No   
 58. Noise Level : Less than 85 DBA at 1m from Valve & Piping System.  
 59. Intertubing Diagram : To be furnished  
 60. Performance Data  
 Linearity : ± 1 % Hyterisis : ± 0.5 %  
 Sensitivity : ± 0.5 % Accuracy (overall) : ± 2 %

**VALVE SIZING DATA:**

61. Medium : SH Steam  Sat. Steam   
 Water   
 62. Flow rate in T/Hr  
 63. Operating inlet pressure in Kg/cm<sup>2</sup> (a)  
 64. Operating inlet temperature in °C  
 65. Outlet pressure in Kg/cm<sup>2</sup> (a)  
 66. Viscosity : --  
 67. Operating (required) Cv  
 68. Operating noise level at 1.0 metre from valve surface  
 69. Outlet velocity

CONDITION					
1	2	3	4	5	6
REFER DRAWING No. 4-00-306-40439 FOR VALVE SIZING DATA					
REFER STANDARD TABLE					
<85	dba	(for all conditions)			

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<b>DESIGN DATA:</b>		(A) Steam	(B) Spray		
70. Design Pressure Kg/cm <sup>2</sup> (g)	: 272.4	47	}*	75. lift at various operating	
71. Design Temperature °C	: 568	55		Conditions 1 TO 6	: *
72. Rated/Design/Selected Cv of valve	: Vendor to			76. Down stream limitations	: *
	limit Cv value of max. 430			77. Up stream limitations	: *
73. Velocity restriction	: *			78. Increase in signal Air	: To open the Valve
74. Operating lift restriction	: 10 to 80 % .				
* {MAX.CLASS RATING BETWEEN (A)&(B) SHALL BE THE CLASS RATING FOR THE TOTAL VALVE					

<b>TESTING/INSPECTION:</b>			
79. Hydraulic test report	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	84. Accessories functional	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
80. Radiography : Critical Parts	: <input checked="" type="checkbox"/> Total <input type="checkbox"/>	Test	:
Not required	: <input type="checkbox"/>	85. Seat leakage test	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
81. IBR test report : Reqd.	: <input checked="" type="checkbox"/>	86. Material test report	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
82. Type test : Capacity Evolution by *		87. Customer Inspection	:
ISA S39.2/5 39.4 : Required.		In process	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
83. Valve functional test	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Final	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
* Type test to be done atleast for one no on this consignment.		88. Third Party inspection	: Yes <input type="checkbox"/> No <input type="checkbox"/>

<b>DOCUMENTATION: (Required)</b>			
89. With bid. (3 sets)		91. With equipment	:
Catalogues	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Dimensional drawing	: 15 Sets
Dimensional drawing	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	O & M **	: --do--
All data sheets	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Data Sheets	: --do--
Recommendation / Limitation	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Test certificate	: 1RTF + 3 Sets
Confirmatory report	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	92. Valve sizing, actuator sizing,	
Contrary report	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	noise level calculations required	
Deviation report	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	with bid(with formulae)	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
90. Quality plan	: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	93. --	

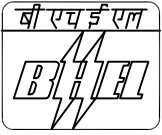
<b>SPARES:</b>			
94. Commissioning spares	: *	96. 2/3 Years maintenance spares	: *
95. Mandatory spares	: As per specification		

<b>OTHERS:</b>			
97. Bidders experience list	: Required <input checked="" type="checkbox"/> Not required <input type="checkbox"/>		
98. Operational feed back of such valves supplied elsewhere	: Required <input checked="" type="checkbox"/> Not required <input type="checkbox"/>		
99. Equipment guarantee	: Required <input checked="" type="checkbox"/> Not required <input type="checkbox"/>		
100. System guarantee	: Required <input checked="" type="checkbox"/> Not required <input type="checkbox"/>		
101. Service contract for 5 Years	: - To quote seperately		
102. Commissioning of the valves	: Required <input type="checkbox"/> Not required <input checked="" type="checkbox"/>		

**NOTES:**  
 1. \* DENOTES BIDDER TO SPECIFY                      2.\*\*VIDEO MANUAL PREFERRED.

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CI 12/A



# CONTROL VALVE SPECIFICATION SHEET

( IN ACCORDANCE WITH I.S.A. FORM S20.51 )

**PROJECT:**  
NTPC-GADARWARA STPP STAGE-I (2x800MW)

**CUST.No:** 7216,7217

**GENERAL: THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION** PC: TSP: APRDS

- |                           |                                       |                       |                |
|---------------------------|---------------------------------------|-----------------------|----------------|
| 1. Valve tag No.          | AS-26                                 | 5. Manufacturer       | : *            |
| 2. Service                | : Low capacity Pressure Control valve | 6. Model No.          | : *            |
| 3. Line No./Vessel No.    | :                                     | 7. Rating             | : ASME CL. 600 |
| 4. Qty. required per unit | : 1 No.                               | 8. Total Qty Required | : 2 Nos.       |

**BODY:**

- |                            |   |                                |                              |  |  |
|----------------------------|---|--------------------------------|------------------------------|--|--|
| 9. Type :                  | Thru <input checked="" type="checkbox"/>  | 3 Way <input type="checkbox"/> | 16. Bonnet type :            | Standard <input type="checkbox"/>                        | Finned <input checked="" type="checkbox"/> |
|                            | Z type <input type="checkbox"/>           | Angle <input type="checkbox"/> |                              | Extended <input checked="" type="checkbox"/>             | Pr. seal <input type="checkbox"/>          |
| 10. Form :                 | Globe <input checked="" type="checkbox"/> | Ball <input type="checkbox"/>  | 17. Material :               | Body : ASTM A 216 Gr WCC                                 |  |
|                            | Butterfly <input type="checkbox"/>        | <input type="checkbox"/>       |                              | Packing: GRAFOIL   |  |
| 11. Size                   | : *                                       |                                |                              | Bolting : *  |  |
| 12. Port Size              | : *                                       |                                | 18. Flow direction           | : HORIZONTAL   |  |
| 13. Connecting pipe size : | Inlet : OD 168.3X10.97                    |                                | 19. Suitable matching pieces | to match with pipe/bold size specified shall be offered. |  |
|                            | Outlet : OD 273X12.7                      |                                |                              |  |  |
| 14. Body rating            | : ASME CL. 600                            |                                |                              |  |  |

- |                               |                                  |  |                             |
|-------------------------------|----------------------------------|--|-----------------------------|
| 15. Type of end connections : | Screwed <input type="checkbox"/> | BW <input checked="" type="checkbox"/> | SW <input type="checkbox"/> |
|                               | NPI <input type="checkbox"/>     | BSPT <input type="checkbox"/>          | BS <input type="checkbox"/> |
|                               | Flanged <input type="checkbox"/> | <input type="checkbox"/>               | <input type="checkbox"/>    |
|                               | ANSI <input type="checkbox"/>    | DIN <input type="checkbox"/>           | <input type="checkbox"/>    |

Edge Preparation as per BPS.

**TRIM:**

- |                           |  |                         |   |                                      |
|---------------------------|--|-------------------------|---|--------------------------------------|
| 20. No. of ports          | : *  | 24. Stem material       | : | } 17.4 PH SST / SS 316 OR EQUIVALENT |
| 21. Type :                | Balanced <input checked="" type="checkbox"/> | 25. Plug material       | : |                                      |
|                           | Unbalanced <input type="checkbox"/>          | 26. Seat material       | : |                                      |
| 22. Plug characteristics: | <del>L/LV/EP</del> / <del>MODIFIED EP</del>  | 27. Disc material       | : |                                      |
| 23. Guiding :             | Cage <input checked="" type="checkbox"/>     | 28. stem guide material | : |                                      |
|                           | Port <input type="checkbox"/>                | 29. --                  |   |                                      |
|                           | Top <input type="checkbox"/>                 |                         |   |                                      |
|                           | Bottom <input type="checkbox"/>              |                         |   |                                      |

**ACTUATOR:**

- |                         |   |   |   |        |
|-------------------------|---|---|---|--------|
| 30. Type :              | Electric <input type="checkbox"/>           | Pneumatic <input checked="" type="checkbox"/> | 34. Diaphragm/Cylinder pressure at                            |        |
|                         | Hydraulic <input type="checkbox"/>          | DA/RA(Air To Close)                           | Valve full open   | : *    |
|                         |   |   | Valve full close  | :      |
| 31. Size                | : *   |   | 35. Force required for process & Force available at actuator. | : *    |
| 32. Supply              | : 45 PSIG                                   |   | 36. Actuator sizing ΔP  | : *    |
| 33. Failsafe position : | Stayput <input checked="" type="checkbox"/> |   | 37. If actuator electric fill in data sheet as per annexure   | : NAPL |
|                         | Full Close <input type="checkbox"/>         | Full Open <input type="checkbox"/>            | furnished and shall comply with annexure-I specification.     |        |

NTPC DOC NO. 9572-102-PC-PVI-Y-026

DRG. NO: 4-00-306-40443 REV 00

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**POSITIONER:**

38. Type : Pneumatic  Electronic   
 DA/RA Electro Pneumatic   
 (SMART WITH FAIL FREEZE FACILITY)  
 39. If Electronic : Type :  
 Model : Solid plate deversing contactors  
 Main contactor : Solid state thyristor:   
 Relay Switching :   
 Also refer annexure - II  
 position indicator reqd. for Valve & VCB

40. If Pneumatic : Type : \*  
 Model : \*  
 Split range : Yes  No   
 Controller Input & Output Signal Value : 4-20 mA  
 Air supply : 45 PSIG  
 Input/Output Pr. guage :  
 Required : Yes  No   
 By pass provision : Yes  No   
 Action : Direct  Reverse  Both   
 Cam : =%  Linear  Both

**ACCESSORIES:**

41. Handwheel : Yes  Side  Top   
 42. Air filter : Yes  No   
 Filter Size : 5 Micron  25 Micron   
 43. Limit Switches : Yes  No   
 Qty. : 1 at full open & 1 at full close  
 Rating : 240v. 5Amp. ac  
 No of contacts per switch : 2No + 2NC  
 44. Solenoid valve to effect  
 Stayput : Yes  No   
 Type : 3 Way universal: Yes  No   
 Rating : 24V DC 2 wire  
 Class H coil : Yes  No   
 45. Vol. booster : Yes  No   
 46. Travel time : \*  
 47. Installation : Indoor  Outdoor   
 48. All accessories enclosure : \*

49. Isolated Position transmitter : Yes  No   
 Type : Pneumatic :  Electronic Non contact type   
 Rating : 2 wire 24V DC:   
 Output : 4-20 ma :  3-15 paig   
 50. Torque Switches : Yes  No   
 Qty. :  
 Rating :  
 51. Air lock : Yes  No   
 Function : TO EFFECT STAYPUT  
 Type \* : 3 Way single acting   
 : 3 Way double acting   
 52. Ambience : Dusty corrosive   
 Toxic hazardous :   
 53.1. Local position Indicator: Required.  
 53.2. Integral JB : 36 Way JB required  
 53.3. All electrical terminating : plug & socket type

**MISCELLANEOUS:**

54. Seat leakage : FCI 70.2 class  CLASS IV  
 I.S.A :    
 55. Approx. weight (total) : \*  
 56. Space requirements for online servicing : \*

57. Valve sizing as per ISA 75.01 : Yes  No   
 58. Noise Level : Less than 85 DBA at 1m from Valve & Piping System.  
 59. Intertubing Diagram : As per Enclosed.  
 60. Performance Data  
 Linearity : ± 1 % Hyterisis : ± 0.5 %  
 Sensitivity : ± 0.5 % Accuracy (overall) : ± 2 %

**VALVE SIZING DATA:**

61. Medium : SH Steam  Sat. Steam   
 Water   
 62. Flow rate in T/Hr  
 63. Operating inlet pressure in Kg/cm<sup>2</sup> (a)  
 64. Operating inlet temperature in °C  
 65. Outlet pressure in Kg/cm<sup>2</sup> (a)  
 66. Viscosity : --  
 67. Operating (required) Cv  
 68. Operating noise level at 1.0 metre from valve surface  
 69. Outlet velocity

CONDITION	
1	2
REFER DRAWING No. 4-00-306-40437 FOR VALVE SIZING DATA	
REFER STANDARD TABLE	
<85 dba	(for all conditions)

13.08.2014	D.MATHANGI	SARAVANAN.C	R.PRABA
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**DESIGN DATA:**

70. Design Pressure Kg/cm<sup>2</sup>(g) : 73.1 Kg/Cm<sup>2</sup> (g)
71. Design Temperature °C : 379 °C
72. Rated/Design/Selected Cv of valve : \*
73. Velocity restriction : \*
74. Operating lift restriction : 10 to 80 % .
75. lift at various operating Conditions 1 TO 2 : \*
76. Down stream limitations : \*
77. Up stream limitations : \*
78. Increase in signal Air : To open the Valve

**TESTING/INSPECTION:**

79. Hydraulic test report : Yes  No
80. Radiography : Critical Parts :  Total   
Not required :
81. IBR test report : Reqd. :
82. Type test : Capacity Evolution by \*  
ISA S39.2/5 39.4 : Required.
83. Valve functional test : Yes  No
- \* Type test to be done atleast for one no on this consignment.
84. Accessories functional : Yes  No   
Test :
85. Seat leakage test : Yes  No
86. Material test report : Yes  No
87. Customer Inspection :  
In process : Yes  No   
Final : Yes  No
88. Third Party inspection : Yes  No

**DOCUMENTATION:** (Required)

89. With bid. (3 sets)
- Catalogues : Yes  No
- Dimensional drawing : Yes  No
- All data sheets : Yes  No
- Recommendation / Limitation : Yes  No
- Confirmatory report : Yes  No
- Contrary report : Yes  No
- Deviation report : Yes  No
90. Quality plan : Yes  No
91. With equipment :
- Dimensional drawing : 15 Sets
- O & M : --do--
- Data Sheets : --do--
- Test certificate : 1RTF + 3 Sets
92. Valve sizing, actuator sizing, noise level calculations required with bid(with formulae) : Yes  No
93. --

**SPARES:**

94. Commissioning spares : \*
95. Mandatory spares : As per specification
96. 2/3 Years maintenance spares : \*

**OTHERS:**

97. Bidders experience list : Required  Not required
98. Operational feed back of such valves supplied elsewhere : Required  Not required
99. Equipment guarantee : Required  Not required
100. System guarantee : Required  Not required
101. Service contract for 5 Years : - To quote seperately
102. Commissioning of the valves : Required  Not required

**NOTES:**

1. \* DENOTES BIDDER TO SPECIFY

13.08.2014	D.MATHANGI	SARAVANAN.C	R.PRABA	DRG. NO:	4-00-306-40443	REV
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# CONTROL VALVE SPECIFICATION SHEET

( IN ACCORDANCE WITH I.S.A. FORM S20.51 )

PROJECT:

NTPC-GADARWARA STPP STAGE-I (2x800MW)

CUST.No: 7216,7217

**GENERAL: THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION** PC: TSP: APRDS

1. Valve tag No. : FD-43  
 2. Service : Common  
 Spray Block valve  
 3. Line No./Vessel No. :  
 4. Qty. required per unit : 1 No.

5. Manufacturer : \*  
 6. Model No. : \*  
 7. Rating : ASME CL.300  
 8. Total Qty Required : 2 Nos.

**BODY:**

9. Type : Thru  3 Way   
 Z type  Angle   
 10. Form : Globe  Ball   
 Butterfly   
 11. Size : \*  
 12. Port Size : \*  
 13. Connecting pipe size : Inlet : OD 60.3X5.54  
 Outlet : OD 60.3X5.54  
 14. Body rating : ASME CL.300

16. Bonnet type : Standard  Finned   
 Extended  Pr. seal   
 17. Material : Body : WC6  
 Packing: GRAFOIL  
 Bolting : \*  
 18. Flow direction : HORIZONTAL  
 19. Suitable matching pieces to match with pipe size specified shall be offered.

15. Type of end connections : Screwed  BW  SW   
 NPI  BSPT  BS   
 Flanged   
 ANSI  DIN

Edge Preparation as per BPS.

**TRIM:**

20. No. of ports : \*  
 21. Type : Balanced/Unbalanced  
 22. Plug characteristics: QUICK OPENING  
 23. Guiding : Cage  Port  Top   
 Bottom

24. Stem material : 316 SST Strain Hardened  
 25. Plug material :  
 26. Seat material :  
 27. Disc material : } 17.4 PH SST/416C SST  
 OR EQUIVALENT  
 28. stem guide material :  
 29. --

**ACTUATOR:**

30. Type : Electric  Pneumatic   
 Hydraulic  DA/RA (Air To Close)  
 31. Size : \*  
 32. Supply : 45 PSIG  
 33. Failsafe position : Stayput   
 of valve. Full Close  Full Open

34. Diaphragm/Cylinder pressure at  
 Valve full open : \*  
 Valve full close :  
 35. Force required for process &  
 Force available at actuator. : \*  
 36. Actuator sizing ΔP : \*  
 37. If actuator electric fill in  
 data sheet as per annexure : NAPL  
 furnished and shall comply  
 with annexure-I specification.

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 DRG. NO: 32 4-00-306-40444  
 REV 00

**POSITIONER: NOT REQUIRED**

38. Type : Pneumatic  Electronic   
 DA/RA Electro Pneumatic

39. If Electronic : Type :  
 Model : Solid plate deversing contactors

Main contactor : Solid state thyristor:   
 Relay Switching :

Also refer annexure - II  
 position indicator reqd. for Valve & VCB

40. If Pneumatic : Type : \*  
 Model : \*  
 Split range : Yes  No   
 Controller Input & Output Signal Value : 4-20 mA  
 Air supply : 45 PSIG  
 Input/Output Pr. guage :  
 Required : Yes  No   
 By pass provision : Yes  No   
 Action : Direct  Reverse  Both   
 Cam : =%  Linear  Both

**ACCESSORIES:**

41. Handwheel : Yes  Side  Top   
 42. Air filter : Yes  No   
 Filter Size : 5 Micron  25 Micron   
 43. Limit Switches : Yes  No   
 Qty. : 1 at full open & 1 at full close  
 Rating : 240v. 5Amp. ac  
 No of contacts per switch : 2No + 2NC

44. Solenoid valve as pilot device  
 Stayput : Yes  No   
 Type : 4 Way Dual coil Universal: Yes  No   
 Rating : 24V DC 2 wire  
 Class H coil : Yes  No

45. Vol. booster : Yes  No   
 46. Travel time : < 10 Sec.  
 47. Installation : Indoor  Outdoor   
 48. All accessories enclosure : \*

49. Position transmitter : Yes  No   
 Type : Pneumatic :  Electronic Non contact type   
 Rating : 2 wire 24V DC:   
 Output : 4-20 ma :  3-15 paig   
 50. Torque Switches : Yes  No   
 Qty. :  
 Rating :  
 51. Air lock : Yes  No   
 Function : TO EFFECT STAYPUT  
 Type \* : 3 Way single acting   
 : 3 Way double acting   
 52. Ambience : Dusty corrosive   
 Toxic hazardous :   
 53.1. Local position Indicator: Required.  
 53.2. I/P converter with A/F regulator : Not Required  
 53.3 Integral JB : 36 Way JB required  
 53.4 All electrical terminating : plug & socket type

**MISCELLANEOUS:**

54. Seat leakage : ASME FCI/RP 70.2  CLASS V  
 I.S.A :    
 55. Approx. weight (total) : \*  
 56. Space requirements for online servicing : \*

57. Valve sizing as per ISA 75.01 : Yes  No   
 58. Noise Level : Less than 85 DBA at 1m from Valve & Piping System.  
 59. Intertubing Diagram : To be furnished  
 60. Performance Data  
 Linearity : ± 1 % Hyterisis : ± 0.5 %  
 Sensitivity : ± 0.5 % Accuracy (overall) : ± 2 %

**VALVE SIZING DATA:**

61. Medium : SH Steam  Sat. Steam   
 Water

62. Flow rate in T/Hr  
 63. Operating inlet pressure in Kg/cm<sup>2</sup> (a)  
 64. Operating inlet temperature in °C  
 65. Outlet pressure in Kg/cm<sup>2</sup> (a)  
 66. Viscosity : --  
 67. Operating (required) Cv  
 68. Operating noise level at 1.0 metre from valve surface  
 69. Outlet velocity

CONDITION							
1	2	3	4	5	6	7	8
REFER DRAWING No. 4-00-306-40438 FOR VALVE SIZING DATA							
REFER STANDARD TABLE							
<85 dba (for all conditions)							

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**DESIGN DATA:**

- |  |   |
|--|---|
| 70. Design Pressure Kg/cm <sup>2</sup> (g) : 47 Kg/Cm <sup>2</sup> (g) | 75. lift at various operating Conditions 1 TO 8 : * |
| 71. Design Temperature °C :55  | 76. Down stream limitations : *                     |
| 72. Rated/Design/Selected Cv of valve : *                              | 77. Up stream limitations : *                       |
| 73. Velocity restriction : *   | 78. Increase in signal Air : To open the Valve      |
| 74. Operating lift restriction : -                                     |   |

**TESTING/INSPECTION:** (AS PER M/S NTPC APPROVED QUALITY PLAN: )

- |   |   |
|---|---|
| 79. Hydraulic test report : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>       | 84. Accessories functional : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>              |
| 80. Radiography : Critical Parts : <input checked="" type="checkbox"/> Total <input type="checkbox"/> | Test : <input type="checkbox"/>   |
| Not required : <input type="checkbox"/>   | 85. Seat leakage test : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>                   |
| 81. IBR test report : Reqd. : <input checked="" type="checkbox"/>                                     | 86. Material test report : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>                |
| 82. Type test : Capacity Evolution by *<br>ISA S39.2/5 39.4 : Required.                               | 87. Customer Inspection :<br>In process : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| 83. Valve functional test : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>       | Final : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>                                   |
| * Type test to be done atleast for one no on this consignment.  | 88. Third Party inspection : Yes <input type="checkbox"/> No <input type="checkbox"/>                         |

**DOCUMENTATION:** (Required)

- |   |  |
|---|--|
| 89. With bid. (3 sets)  | 91. With equipment :   |
| Catalogues : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>                  | Dimensional drawing : 15 Sets  |
| Dimensional drawing : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>         | O & M : --do--   |
| All data sheets : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>             | Data Sheets : --do--   |
| Recommendation / Limitation : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | Test certificate : 1RTF + 3 Sets   |
| Confirmatory report : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>         | 92. Valve sizing, actuator sizing,<br>noise level calculations required<br>with bid(with formulae) : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |
| Contrary report : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>             | 93. --   |
| Deviation report : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>            |  |
| 90. Quality plan : Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>            |  |

**SPARES:**

- |   |                                      |
|---|--------------------------------------|
| 94. Commissioning spares : *                | 96. 2/3 Years maintenance spares : * |
| 95. Mandatory spares : As per specification |                                      |

**OTHERS:**

- |  |
|--|
| 97. Bidders experience list : Required <input checked="" type="checkbox"/> Not required <input type="checkbox"/>                                 |
| 98. Operational feed back of such valves supplied elsewhere : Required <input checked="" type="checkbox"/> Not required <input type="checkbox"/> |
| 99. Equipment guarantee : Required <input checked="" type="checkbox"/> Not required <input type="checkbox"/>                                     |
| 100. System guarantee : Required <input checked="" type="checkbox"/> Not required <input type="checkbox"/>                                       |
| 101. Service contract for 5 Years : - To quote seperately  |
| 102. Commissioning of the valves : Required <input type="checkbox"/> Not required <input checked="" type="checkbox"/>                            |

**NOTES:**

1. \* DENOTES BIDDER TO SPECIFY

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CI 12/A



# CONTROL VALVE SPECIFICATION SHEET

( IN ACCORDANCE WITH I.S.A. FORM S20.51 )

**PROJECT:**  
NTPC LTD.  
NTPC-GADARWARA STPP STAGE-1 (2x800MW)

**CUST.No:** 7216,7217

**GENERAL: THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION**

- 1. Valve tag No. : FD-45 & FD-48
- 2. Service : High capacity Spray Control valve
- 3. Line No./Vessel No. :
- 4. Qty. required per unit : ONE EACH

- 5. Manufacturer : \*
- 6. Model No. : \*
- 7. Rating : ASME CL. 300
- 8. Total Qty Required : 4 NOS

**BODY:**

- 9. Type : Thru  3 Way   
Z type  Angle
- 10. Form : Globe  Ball   
Butterfly
- 11. Size : \*
- 12. Port Size : \*
- 13. Connecting pipe size : Inlet : OD 60.3 x 5.54  
Outlet : OD 60.3 x 5.54
- 14. Body rating : ASME CL. 300

- 16. Bonnet type : Standard  Finned   
Extended  Pr. seal
- 17. Material : Body : WC6  
Packing: GRAFOIL  
Bolting : \*
- 18. Flow direction : HORIZONTAL
- 19. Suitable matching pieces to match with pipe/bold size specified shall be offered.

- 15. Type of end connections : Screwed  BW  SW   
NPI  BSPT  BS   
Flanged   
ANSI  DIN

Edge Preparation as per BPS.

- TRIM:** MULTI STAGE, LOW RECOVERY / \*
- 20. No. of ports : \*
  - 21. Type : Balanced/Unbalanced
  - 22. Plug characteristics: Equal Percentage / Linear
  - 23. Guiding : Cage  Port  Top   
Bottom

- 24. Stem material : }
- 25. Plug material : }
- 26. Seat material : } 17.4 PH SST
- 27. Disc material : } OR EQUIVALENT
- 28. stem guide material : }
- 29. --

**ACTUATOR:**

- 30. Type : Electric  Pneumatic   
Hydraulic  DA/RA (Air To Close)
- 31. Size : \*
- 32. Supply : 45 PSIG
- 33. Failsafe position : Stayput   
of valve. Full Close  Full Open

- 34. Diaphragm/Cylinder pressure at  
Valve full open : \*  
Valve full close : \*
- 35. Force required for process &  
Force available at actuator. : \*
- 36. Actuator sizing ΔP : \*
- 37. If actuator electric fill in  
data sheet as per annexure : NAPL  
furnished and shall comply  
with annexure-I specification.

00	13.08.2014	FRESH ISSUE	D.MATHANGI	SARAVANAN.C.R.PRABHA	
REV	DATE	ALTERATION	PREPARED	APPROVED	APPD./C&I

NTPC DOC NO.	9572-102-PC-PVI-Y-029
DRG. NO:	4-00-306-40441
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**POSITIONER:**

38. Type : Pneumatic  Electronic   
 DA/RA Electro Pneumatic   
 (SMART WITH FAIL FREEZE FACILITY)  
 39. If Electronic : Type :  
 Model : Solid plate deversing contactors  
 Main contactor : Solid state thyristor:   
 Relay Switching :   
 Also refer annexure - II  
 position indicator reqd. for Valve & VCB

40. If Pneumatic : Type : \*  
 Model : \*  
 Split range : Yes  No   
 Controller Input & Output Signal Value : 4-20 mA  
 Air supply : 45 PSIG  
 Input/Output Pr. guage :  
 Required : Yes  No   
 By pass provision : Yes  No   
 Action : Direct  Reverse  Both   
 Cam : =%  Linear  Both

**ACCESSORIES:**

41. Handwheel : Yes  Side  Top   
 42. Air filter : Yes  No   
 Filter Size : 5 Micron  25 Micron   
 43. Limit Switches : Yes  No   
 Qty. : 1 at full open & 1 at full close  
 Rating : 240v. 5Amp. ac  
 No of contacts per switch : 2No + 2NC  
 44. Solenoid valve to effect  
 Stayput : Yes  No   
 Type : 3 Way universal: Yes  No   
 Rating : 24V DC 2 wire  
 Class H coil : Yes  No   
 45. Vol. booster : Yes  No   
 46. Travel time : \*  
 47. Installation : Indoor  Outdoor   
 48. All accessories enclosure : \*

49. Isolated Position transmitter : Yes  No   
 Type : Pneumatic :  Electronic Non contact type   
 Rating : 2 wire 24V DC:   
 Output : 4-20 ma :  3-15 paig   
 50. Torque Switches : Yes  No   
 Qty. :  
 Rating :  
 51. Air lock : Yes  No   
 Function : TO EFFECT STAYPUT  
 Type : 3 Way single acting   
 : 3 Way double acting   
 52. Ambience : Dusty corrosive   
 Toxic hazardous :   
 53.1. Local position Indicator: Required.  
 53.2. Integral JB : 36 Way JB required  
 53.3. All electrical terminating : plug & socket type

**MISCELLANEOUS:**

54. Seat leakage : FCI 70.2 class  CLASS V  
 I.S.A :    
 55. Approx. weight (total) : \*  
 56. Space requirements for online servicing : \*

57. Valve sizing as per ISA 75.01 : Yes  No   
 58. Noise Level : Less than 85 DBA at 1m from Valve & Piping System.  
 59. Intertubing Diagram : To be furnished  
 60. Performance Data  
 Linearity : ± 1 % Hyterisis : ± 0.5 %  
 Sensitivity : ± 0.5 % Accuracy (overall) : ± 2 %

**VALVE SIZING DATA:**

61. Medium : SH Steam  Sat. Steam   
 Water   
 62. Flow rate in T/Hr  
 63. Operating inlet pressure in Kg/cm<sup>2</sup> (a)  
 64. Operating inlet temperature in °C  
 65. Outlet pressure in Kg/cm<sup>2</sup> (a)  
 66. Viscosity : --  
 67. Operating (required) Cv  
 68. Operating noise level at 1.0 metre from valve surface  
 69. Outlet velocity

CONDITION					
1	2	3	4	5	6
REFER DRAWING No. 4-00-306-40439 FOR VALVE SIZING DATA					
REFER STANDARD TABLE					
<85	dba	(for all conditions)			

13.08.2014	D.MATHANGI	SARAVANAN.C	R.PRABHA
DATE	PREPARED	APPROVED	APPD./C&I

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**DESIGN DATA:**

70. Design Pressure Kg/cm<sup>2</sup>(g) : 47 Kg/Cm<sup>2</sup>(g)
71. Design Temperature °C : 55 °C
72. Rated/Design/Selected Cv of valve : \*
73. Velocity restriction : \*
74. Operating lift restriction : 10 to 80 % .
75. lift at various operating Conditions 1 TO 6 : \*
76. Down stream limitations : \*
77. Up stream limitations : \*
78. Increase in signal Air : To open the Valve

**TESTING/INSPECTION:** (AS PER M/S NTPC APPROVED QUALITY PLAN: )

79. Hydraulic test report : Yes  No
80. Radiography : Critical Parts :  Total   
Not required :
81. IBR test report : Req'd. :
82. Type test : Capacity Evolution by \*  
ISA S39.2/5 39.4 : Required.
83. Valve functional test : Yes  No
- \* Type test to be done atleast for one no on this consignment.
84. Accessories functional : Yes  No   
Test :
85. Seat leakage test : Yes  No
86. Material test report : Yes  No
87. Customer Inspection :  
In process : Yes  No   
Final : Yes  No
88. Third Party inspection : Yes  No

**DOCUMENTATION:** (Required)

89. With bid. (3 sets)
- Catalogues : Yes  No
- Dimensional drawing : Yes  No
- All data sheets : Yes  No
- Recommendation / Limitation : Yes  No
- Confirmatory report : Yes  No
- Contrary report : Yes  No
- Deviation report : Yes  No
90. Quality plan : Yes  No
91. With equipment :
- Dimensional drawing : 15 Sets
- O & M : --do--
- Data Sheets : --do--
- Test certificate : 1RTF + 3 Sets
92. Valve sizing, actuator sizing, Cavitation check, noise level calculations required with bid(with formulae) : Yes  No
93. --

**SPARES:**

94. Commissioning spares : \*
95. Mandatory spares : As per specification
96. 2/3 Years maintenance spares : \*

**OTHERS:**

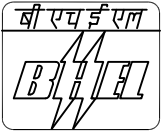
97. Bidders experience list : Required  Not required
98. Operational feed back of such valves supplied elsewhere : Required  Not required
99. Equipment guarantee : Required  Not required
100. System guarantee : Required  Not required
101. Service contract for 5 Years : - To quote seperately
102. Commissioning of the valves : Required  Not required

**NOTES:**

1. \* DENOTES BIDDER TO SPECIFY

13.08.2014	D.MATHANGI	SARAVANAN.C	R.PRABHA	DRG. NO:	REV
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CI 12/A



# CONTROL VALVE SPECIFICATION SHEET

( IN ACCORDANCE WITH I.S.A. FORM S20.51 )

PROJECT:

CUST.No: 7216,7217

NTPC-GADARWARA STPP STAGE-I (2x800MW)

**GENERAL: THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION** PC: TSP: APRDS

- 1. Valve tag No. : FD-52 & FD-55
- 2. Service : Low capacity Spray Control valve
- 3. Line No./Vessel No. :
- 4. Qty. required per unit : 2 Nos.(1No. in each tag)

- 5. Manufacturer : \*
- 6. Model No. : \*
- 7. Rating : ASME CI 300
- 8. Total Qty Required : 4 Nos.

**BODY:**

- 9. Type : Thru  3 Way   
Z type  Angle
- 10. Form : Globe  Ball   
Butterfly
- 11. Size : \*
- 12. Port Size : \*
- 13. Connecting pipe size : Inlet : OD 48.3 x 5.08  
Outlet : OD 48.3 x 5.08
- 14. Body rating : ASME CI 300

- 16. Bonnet type : Standard  Finned   
Extended  Pr. seal
- 17. Material : Body : WC6  
Packing: GRAFOIL  
Bolting : \*
- 18. Flow direction : HORIZONTAL
- 19. Suitable matching pieces to match with pipe size specified shall be offered.

- 15. Type of end connections : Screwed  BW  SW   
NPI  BSPT  BS   
Flanged     
ANSI  DIN

Edge Preparation as per BPS.

**TRIM: MULTI STAGE, LOW RECOVERY / \***

- 20. No. of ports : \*
- 21. Type : Balanced/Unbalanced
- 22. Plug characteristics: Equal Percentage/Linear
- 23. Guiding : Cage  Port  Top   
Bottom

- 24. Stem material : }
  - 25. Plug material : }
  - 26. Seat material : }
  - 27. Disc material : }
  - 28. stem guide material : }
  - 29. --
- 17.4 PH SS / SS 316 OR EQUIVALENT

**ACTUATOR:**

- 30. Type : Electric  Pneumatic   
Hydraulic  DA/RA(Air To Close)
- 31. Size : \*
- 32. Supply : 45 PSIG
- 33. Failsafe position : Stayput   
of valve. Full Close  Full Open

- 34. Diaphragm/Cylinder pressure at  
Valve full open : \*  
Valve full close :
- 35. Force required for process &  
Force available at actuator. : \*
- 36. Actuator sizing ΔP : \*
- 37. If actuator electric fill in  
data sheet as per annexure : NAPL  
furnished and shall comply  
with annexure-I specification.

NTPC DOC NO. 9572-102-PC-PVI-Y-028

DRG. NO: 4-00-306-40440 REV 00

00	13.08.2014	FRESH ISSUE	D.MATHANGI	SARAVANAN	R.PRABA
REV	DATE	ALTERATION	PREPARED	APPD	APPD/C&I

**POSITIONER:**

38. Type : Pneumatic  Electronic   
 DA/RA Electro Pneumatic   
 (SMART WITH FAIL FREEZE FACILITY)  
 39. If Electronic : Type Model : Solid plate deversing contactors  
 Main contactor : Solid state thyristor:   
 Relay Switching :   
 Also refer annexure - II  
 position indicator reqd. for Valve & VCB

40. If Pneumatic Type : \* Model : \*  
 Split range : Yes  No   
 Controller Input & Output Signal Value : 4-20 mA  
 Air supply : 45 PSIG  
 Input/Output Pr. guage :  
 Required : Yes  No   
 By pass provision : Yes  No   
 Action : Direct  Reverse  Both   
 Cam : =%  Linear  Both

**ACCESSORIES:**

41. Handwheel : Yes  Side  Top   
 42. Air filter : Yes  No   
 Filter Size : 5 Micron  25 Micron   
 43. Limit Switches : Yes  No   
 Qty. : 1 at full open & 1 at full close  
 Rating : 240v. 5Amp. ac  
 No of contacts per switch : 2No + 2NC  
 44. Solenoid valve as Stayput : Yes  No   
 Type : 3 Way universal: Yes  No   
 Rating : 24V DC 2 wire  
 Class H coil : Yes  No   
 45. Vol. booster : Yes  No   
 46. Travel time : \*  
 47. Installation : Indoor  Outdoor   
 48. All accessories enclosure : \*

49. Isolated Position transmitter : Yes  No   
 Type : Pneumatic :  Electronic Non contact type   
 Rating : 2 wire 24V DC:   
 Output : 4-20 ma :  3-15 paig   
 50. Torque Switches : Yes  No   
 Qty. :  
 Rating :  
 51. Air lock : Yes  No   
 Function : TO EFFECT STAYPUT  
 Type \* : 3 Way single acting   
 : 3 Way double acting   
 52. Ambience : Dusty corrosive   
 Toxic hazardous :   
 53.1. Local position Indicator: Required.  
 53.2. Integral JB : 36 Way JB required  
 53.3. All electrical terminating : plug & socket type

**MISCELLANEOUS:**

54. Seat leakage : FCI 70.2 class  CLASS V  
 I.S.A :    
 55. Approx. weight (total) : \*  
 56. Space requirements for online servicing : \*

57. Valve sizing as per ISA 75.01 : Yes  No   
 58. Noise Level : Less than 85 DBA at 1m from Valve & Piping System.  
 59. Intertubing Diagram : To be furnished  
 60. Performance Data  
 Linearity : ± 1 % Hyterisis : ± 0.5 %  
 Sensitivity : ± 0.5 % Accuracy (overall) : ± 2 %

**VALVE SIZING DATA:**

61. Medium : SH Steam  Sat. Steam   
 Water   
 62. Flow rate in T/Hr  
 63. Operating inlet pressure in Kg/cm<sup>2</sup> (a)  
 64. Operating inlet temperature in °C  
 65. Outlet pressure in Kg/cm<sup>2</sup> (a)  
 66. Viscosity : --  
 67. Operating (required) Cv  
 68. Operating noise level at 1.0 metre from valve surface  
 69. Outlet velocity

CONDITION							
1	2	3	4	5	6	7	8
REFER DRAWING No. 4-00-306-40438 FOR VALVE SIZING DATA							
REFER STANDARD TABLE							
<85	dba	(for all conditions)					

13.08.2014	D.MATHANGI	SARAVANAN.C	R.PRABA
DATE	PREPARED	APPD	APPD/C&I

DRG. NO:	REV
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**DESIGN DATA:**

70. Design Pressure Kg/cm<sup>2</sup>(g) : 47 Kg/Cm<sup>2</sup>(g)      75. lift at various operating  
 Conditions 1 TO 8 : \*
71. Design Temperature °C : 55 °C      76. Down stream limitations : \*
72. Rated/Design/Selected Cv of valve : \*      77. Up stream limitations : \*
73. Velocity restriction : \*      78. Increase in signal Air : To open the Valve
74. Operating lift restriction : 10 to 80 % .

**TESTING/INSPECTION:** (AS PER M/S NTPC APPROVED QUALITY PLAN: )

79. Hydraulic test report : Yes  No       84. Accessories functional : Yes  No   
 Test :
80. Radiography : Critical Parts :  Total   
 Not required :        85. Seat leakage test : Yes  No
81. IBR test report : Reqd. :        86. Material test report : Yes  No
82. Type test : Capacity Evolution by \*  
 ISA S39.2/5 39.4 : Required.      87. Customer Inspection :  
 In process : Yes  No   
 Final : Yes  No
83. Valve functional test : Yes  No       88. Third Party inspection : Yes  No
- \* Type test to be done atleast for one no on this consignment.

**DOCUMENTATION:** (Required)

89. With bid. (3 sets)  
 Catalogues : Yes  No   
 Dimensional drawing : Yes  No   
 All data sheets : Yes  No   
 Recommendation /  
 Limitation : Yes  No   
 Confirmatory report : Yes  No   
 Contrary report : Yes  No   
 Deviation report : Yes  No
90. Quality plan : Yes  No
91. With equipment :  
 Dimensional drawing : 15 Sets  
 O & M : --do--  
 Data Sheets : --do--  
 Test certificate : 1RTF + 3 Sets
92. Valve sizing, actuator sizing, Cavitation check,  
 noise level calculations required  
 with bid(with formulae) : Yes  No
93. --

**SPARES:**

94. Commissioning spares : \*
95. Mandatory spares : As per specification
96. 2/3 Years maintenance spares : \*

**OTHERS:**

97. Bidders experience list : Required  Not required
98. Operational feed back of such valves supplied elsewhere : Required  Not required
99. Equipment guarantee : Required  Not required
100. System guarantee : Required  Not required
101. Service contract for 5 Years : - To quote seperately
102. Commissioning of the valves : Required  Not required

**NOTES:**

1. \* DENOTES BIDDER TO SPECIFY

13.08.2014	D.MATHANGI	SARAVANAN.C	R.PRABA	DRG. NO:	REV
DATE	PREPARED	APPD	APPD/C&I	40 4-00-306-40440	00

**NTPC**  
**NTPC—GADARWARA STPP STAGE—I (2x800MW)**

**L.T. DESUPERHEATER SPECIFICATION SHEET**

01. Designation/Tag No : Auxiliary steam line / DESH – 1
02. Quantity Required : One
03. Turndown ratio : Bidder to specify
04. Material : ASTM A 106 Gr B
05. Inlet connection/Outlet connection } :  $\phi 457.2 \times 9.53$   
 (Steam side) }  $\phi 457.2 \times 9.53$
06. End connection (Steam side) : Butt Welded
07. Spray water connection : OD 48.3 x 5.08
08. End connection : Butt Welded / Socket Welded
09. Mounting arrangement : Vertical / Horizontal
10. Minimum straight length required : Bidder to specify.  
 U/S of Desuperheater
11. Minimum distance required } : Bidder to specify.  
 downstream of DSH }
12. Sizing Parameters : Refer Drg. No. 4-00-306-40438
13. Design Pressure : 20 Kg / cm<sup>2</sup> (g)
14. Design Temperature : 350 °C
15. Minimum distance required in D/S } : Bidder to specify.  
 of DESH for temp. control sensing element }
16. Minimum distance required in D/S } : Bidder to specify.  
 of DESH for pressure control sensing element }
17. IBR Certification required : Yes
18. Testing/Inspection : As per purchaser approved vendor QP
19. Documents required during offer :

Catalogues, filled up data sheets, Sizing calculations, Turn down ratio calculation, Detailed drawing with BOM, Material specifications, Weight, Special requirements such as Linear, Upstream & Downstream straight length, O&M manual. Quality plan indicating various checks for raw material in process & final inspection stage.

20. Documents required after Placement of Order

Catalogues, Final detailed drawing with BOM, Material } 20 sets plus  
 specification, Weight, Final sizing, Turn down ratio calculation, } 2 sets on CD  
 Testcertificates as per QP and O & M manual.

13.08.14	D.MATHANGI	SARAVANAN.C	R.PRABA	DRG. NO:	4-00-306-40445	REV
DATE	PREPARED	APPD.	APPD/C&I	41		00

CI 12/A



# CONTROL VALVE SPECIFICATION SHEET

( IN ACCORDANCE WITH I.S.A. FORM S20.51 )

PROJECT:

NTPC-GADARWARA STPP STAGE-I (2x800MW)

CUST.No: 7216&7217

**GENERAL: THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION** PC: TSP: APRDS

1. Valve tag No. CDV-93  
 2. Service : Spray Temperature Control valve  
 3. Line No./Vessel No. :  
 4. Qty. required per unit : 1 No. each

5. Manufacturer : \*  
 6. Model No. : \*  
 7. Rating : ASME CI 2500  
 8. Total Qty Required : 4 Nos.

**BODY:**

9. Type : Thru  3 Way   
 Z type  Angle   
 10. Form : Globe  Ball   
 Butterfly    
 11. Size : \*  
 12. Port Size : \*  
 13. Connecting pipe size : Inlet : OD 33.4 x 4.55  
 Outlet : OD 33.4 x 4.55  
 14. Body rating : ASME CI 600

16. Bonnet type : Standard  Finned   
 Extended  Pr. seal   
 17. Material : Body : WC6  
 Packing: GRAFOIL  
 Bolting : \*  
 18. Flow direction : HORIZONTAL  
 19. Suitable matching pieces to match with pipe size specified shall be offered.

15. Type of end connections : Screwed  BW  SW   
 NPI  BSPT  BS   
 Flanged    
 ANSI  DIN

Edge Preparation as per BPS.

**TRIM: MULTI STAGE, LOW RECOVERY / \***

20. No. of ports : \*  
 21. Type : Balanced / Unbalanced  
 22. Plug characteristics: ~~L/LV/EP~~ / ~~MODIFIED EP~~  
 23. Guiding : Cage  Port  Top   
 Bottom

24. Stem material :  
 25. Plug material :  
 26. Seat material :  
 27. Disc material :  
 28. stem guide material :  
 29. --  
 } 17.4 PH SS / SS 316 OR EQUIVALENT

**ACTUATOR:**

30. Type : Electric  Pneumatic   
 Hydraulic  DA/RA(Air To Close)  
 31. Size : \*  
 32. Supply : 45 PSIG  
 33. Failsafe position : Stayput   
 of valve. Full Close  Full Open

34. Diaphragm/Cylinder pressure at  
 Valve full open : \*  
 Valve full close : \*  
 35. Force required for process &  
 Force available at actuator. : \*  
 36. Actuator sizing ΔP : \*  
 37. If actuator electric fill in  
 data sheet as per annexure : NAPL  
 furnished and shall comply  
 with annexure-I specification.

00	30.10.14	FRESH ISSUE	SONALI	SARAVANAN C	R.PRABHA	DRG. NO:	4-00-306-40583	REV	00
REV	DATE	ALTERATION	PREPARED	APPD	APPD/C&I				

**POSITIONER:**

38. Type : Pneumatic  Electronic   
 DA/RA Electro Pneumatic   
 (SMART WITH FAIL FREEZE FACILITY)  
 39. If Electronic : Type :  
 Model : Solid plate deversing  
 contactors  
 Main contactor : Solid state thyristor:   
 Relay Switching :   
 Also refer annexure - II  
 position indicator reqd. for Valve & VCB

40. If Pneumatic : Type : \*  
 Model : \*  
 Split range : Yes  No   
 Controller Input & Output Signal Value : 4-20 mA  
 Air supply : 45 PSIG  
 Input/Output Pr. guage:  
 Required : Yes  No   
 By pass provision : Yes  No   
 Action : Direct  Reverse  Both   
 Cam : =%  Linear  Both

**ACCESSORIES:**

41. Handwheel : Yes  Side  Top   
 42. Air filter : Yes  No   
 Filter Size : 5 Micron  25 Micron   
 43. Limit Switches : Yes  No   
 Qty. : 1 at full open &  
 : 1 at full close  
 Rating : 240v. 5Amp. ac  
 No of contacts per switch : 2No + 2NC  
 44. Solenoid valve to effect  
 Stayput : Yes  No   
 Type : 3 Way universal: Yes  No   
 Rating : 24V DC 2 wire  
 Class H coil : Yes  No   
 45. Vol. booster : Yes  No   
 46. Travel time : \*  
 47. Installation : Indoor  Outdoor   
 48. All accessories enclosure : \*

49. Isolated Position transmitter : Yes  No   
 Type : Pneumatic :  Electronic Non contact type   
 Rating : 2 wire 24V DC:   
 Output : 4-20 ma :  3-15 paig   
 50. Torque Switches : Yes  No   
 Qty. :  
 Rating :  
 51. Air lock : Yes  No   
 Function : TO EFFECT STAYPUT  
 Type \* : 3 Way single acting   
 : 3 Way double acting   
 52. Ambience : Dusty corrosive   
 Toxic hazardous :   
 53.1. Local position Indicator : Required.  
 53.2. Integral JB : 36 Way JB required  
 53.3. All electrical terminating : plug & socket type

**MISCELLANEOUS:**

54. Seat leakage : FCI 70.2 class  CLASS V  
 I.S.A :    
 55. Approx. weight (total) : \*  
 56. Space requirements for online servicing : \*

57. Valve sizing as per ISA 75.01 : Yes  No   
 58. Noise Level : Less than 85 DBA at 1m from Valve & Piping System.  
 59. Intertubing Diagram : As per Enclosed.  
 60. Performance Data  
 Linearity : ± 1 % Hysterisis : ± 0.5 %  
 Sensitivity : ± 0.5 % Accuracy (overall) : ± 2 %

**VALVE SIZING DATA:**

61. Medium : SH Steam  Sat. Steam   
 Water   
 62. Flow rate in T/Hr  
 63. Operating inlet pressure in Kg/cm<sup>2</sup> (a)  
 64. Operating inlet temperature in °C  
 65. Outlet pressure in Kg/cm<sup>2</sup> (a)  
 66. Viscosity : --  
 67. Operating (required) Cv  
 68. Operating noise level at 1.0 metre from valve surface  
 69. Outlet velocity

CONDITION				
1	2	3	4	5
REFER DRAWING No. 4-00-306-40582 FOR VALVE SIZING DATA				
REFER STANDARD TABLE				
<85 dba (for all coditions)				

30.10.14	SONALI	SARAVANAN C	R.PRABHA	DRG. NO:	REV
DATE	PREPARED	APPD.	APPD/C&I	43	4-00-306-40583 00



## NTPC – GADARWARA STPP STAGE – I (2x800MW)

**L.T. DESUPERHEATER SPECIFICATION SHEET**

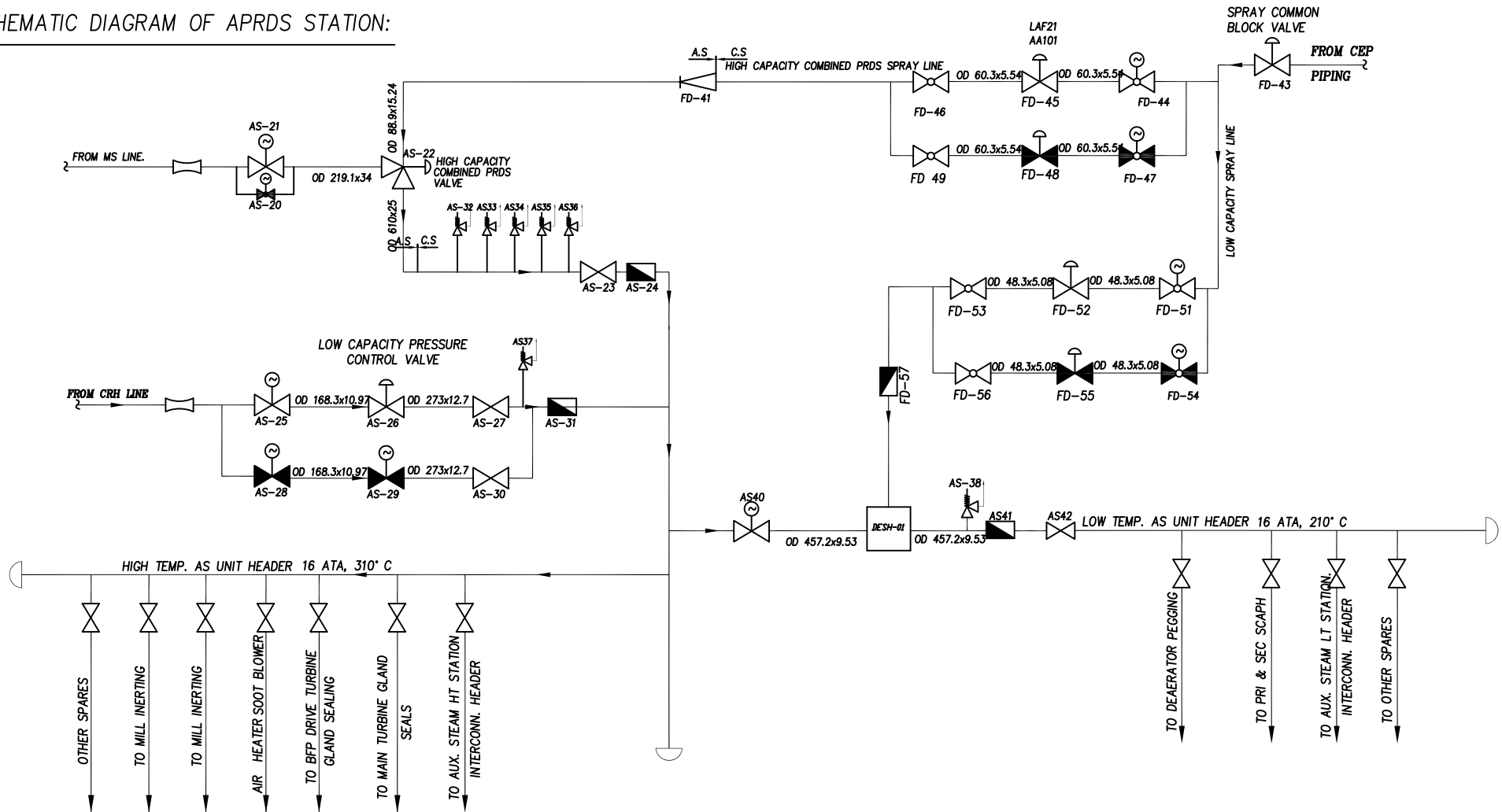
01. Designation/Tag No : Auxiliary steam line / DESH – 2
02. Quantity Required : One per unit
03. Turndown ratio : Bidder to specify
04. Material : ASTM A 106 Gr B
05. Inlet connection/Outlet connection } :  $\phi 88.9 \times 5.49$   
(Steam side) }  $\phi 88.9 \times 5.49$
06. End connection (Steam side) : Butt Welded
07. Spray water connection : OD 33.4 x 4.55
08. End connection : Butt Welded / Socket Welded
09. Mounting arrangement : ~~Vertical~~ / Horizontal
10. Minimum straight length required : Bidder to specify.  
U/S of Desuperheater
11. Minimum distance required } : Bidder to specify.  
downstream of DSH }
12. Sizing Parameters : Refer Drg. No. 4-00-306-40582
13. Design Pressure : 20 Kg / cm<sup>2</sup> (g)
14. Design Temperature : 350 °C
15. Minimum distance required in D/S } : Bidder to specify.  
of DESH for temp. control sensing }
16. Minimum distance required in D/S } : Bidder to specify.  
of DESH for pressure control sensing }
17. IBR Certification required : Yes
18. Testing/Inspection : As per purchaser approved vendor QP
19. Documents required during offer :
- Catalogues, filled up data sheets, Sizing calculations, Turn down ration calculation, Detailed drawing with BOM, Material specifications, Weight, Special requirements such as Liner, Upstream & Downstream straight length, O & M manual. Quality plan indicating various checks for raw material in process & final inspection stage.
20. Documents required after Placement of Order
- Catalogues, Final detailed drawing with BOM, Material } 20 sets plus  
specification, Weight, Final sizing, Turn down ratio calculation, } 2 sets on CD  
Testcertificates as per QP and O & M manual.

30.10.14	SONALI	SARAVANAN C	R.PRABHA	DRG. NO:	REV
DATE	PREPARED	APPD.	APPD/C&I	45 4-00-306-40584	00

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DRAWING No  
3-00-301-31301

**SCHEMATIC DIAGRAM OF APRDS STATION:**



CUST.NO: 7216 & 7217

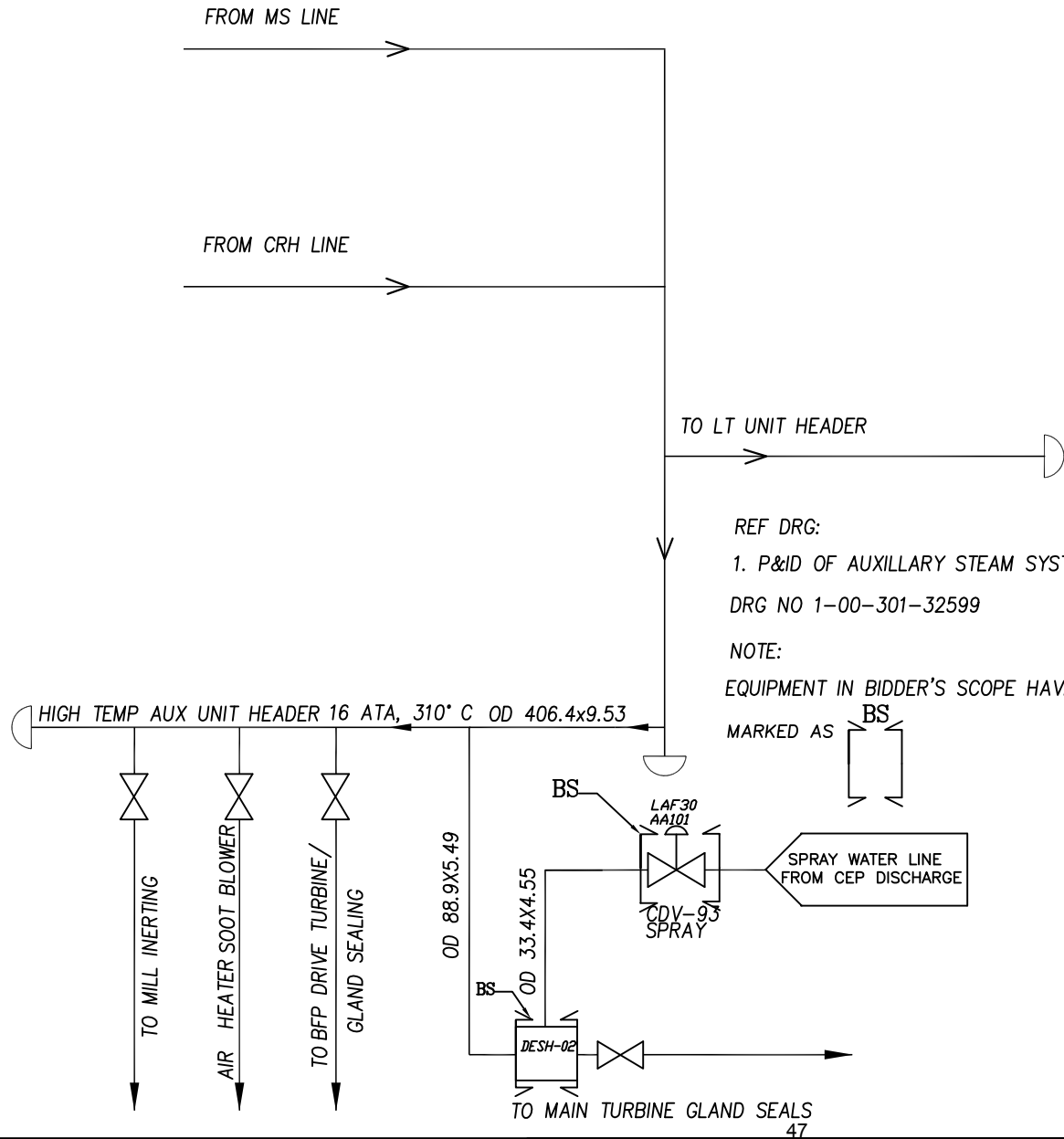
NTPC LTD.  
GADARWARA SUPER THERMAL POWER PROJECT  
STAGE-1; 2 x 800MW  
STEAM GENERATOR PACKAGE

DRAWN	CHECKED	APPROVED	DATE
D.MATHANGI	C.SARAVANAN	R.PRABA	25.08.14

TITLE	DRAWING No	REV
AUX PRDS STATION SCHEME	3-00-301-31301	00

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DRAWING No 4-00-306-40585



REF DRG:  
1. P&ID OF AUXILLARY STEAM SYSTEM  
DRG NO 1-00-301-32599

NOTE:  
EQUIPMENT IN BIDDER'S SCOPE HAVE BEEN  
MARKED AS BS

CUSTOMER NO.: 7216 & 7217

CAUTION: THE DRAWING IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LTD., AND IS NOT TO BE REPRODUCED OR USED TO FURNISH ANY INFORMATION FOR MAKING OF DRAWINGS OR APPARATUS EXCEPT WHERE PROVIDED FOR AGREEMENT WITH SAID COMPANY.		CONSULTANT : NTPC LTD.			
		NTPC DRG.NO.			
		GADARWARA SUPER THERMAL POWER PLANT STAGE-1 (2 X 800 MW) STEAM GENERATOR PACKAGE			
 BHARAT HEAVY ELECTRICALS LTD PIPING CENTRE CHENNAI -- 600 017	DEPT CODE	NAME	SIGN	DATE	
	M	DRN MATHANGLD	-SD-	01.11.14	
		APPD C.SARAVANAN	-SD-	01.11.14	
		APPD PRABHA	-SD-	01.11.14	
TITLE TURBINE GLAND SEALING DESUPERHEATER SCHEME					
DRAWING NO. <b>4-00-306-40585</b>		SCALE NTS	NTPC DRG No.		
		SHEET 1 OF 1		REV 00	
		SIZE A4			



## NTPC-GADARWARA STPP STAGE-I (2x800MW)

## LOW CAPACITY PRV SIZING DATA (AS-26)

S.No.	MEDIUM :	SH STEAM	CONDITION					
			1	2				
			CASE 5 CP@40%	CASE 5 SP@40%				
01	STEAM FLOW RATE	T/Hr.	0.0	30.0				
02	STEAM OPERATING INLET PR.	Kg/cm <sup>2</sup> (a)	61.42	61.42				
03	STEAM OPERATING INLET TEMP.	°C	347.6	347.6				

04	STEAM OUTLET PRESSURE	Kg/cm <sup>2</sup> (a)	16 +Δp DSH	16 +Δp DSH				
05	STEAM OUTLET TEMP.	°C	300.51	300.51				
06	Cv REQUIRED ( STEAM )		*	*				
07	OPERATING NOISE LEVEL AT 1.0 METRE		*	*				
08	OUTLET VELOCITY		*	*				

NOTES:— 1. Δp DSH → STEAM SIDE Δp ACROSS L.T.DESUPERHEATER

2. \* BIDDER TO SPECIFY

REV	DATE	ALTERED
01		APPROVED
ZONE		

PREPARED	CHECKED	APPROVED	DATE 48	DRG.No.		REV.
D MATHANGI	SARAVANAN.C	R.PRABHA	13.08.14	4-00-306-40437	SH. 1 OF 1	00



NTPC-GADARWARA STPP STAGE-I (2x800MW)

CUST. No: 7216,7217

SIZING DATA FOR LT DESUPERHEATER( DESH-01 ),FD43 & FD52(FD55)

S.No.	MEDIUM : SH STEAM	CONDITION											REMARKS
		1	2	3	4	5	6	7	8	9	10	11	
		CASE 9	CASE 1	CASE 3	CASE 4	CASE 2	CASE 7	CASE 8	CASE 10	CASE 5	CASE 6	CASE 11	
01	STEAM FLOW RATE INLET T/Hr.	100.75	100.05	52.23	52.23	107.25	90.67	107.16	107.22	0.00	0.00	0.00	
02	STEAM OPERATING INLET PR. Kg/cm <sup>2</sup> (a)	16 +dp DSH	13.5 +dp DSH	16 +dp DSH	16 +dp DSH	16 +dp DSH	16 +dp DSH	16 +dp DSH	16 +dp DSH	16 +dp DSH	16 +dp DSH	16 +dp DSH	
03	STEAM OPERATING INLET TEMP. °C	310	227.10	310	310	309.57	310	310	310	300.51	300.51	310	

S.No.	MEDIUM : SPRAY WATER	CONDITION											REMARKS
		1	2	3	4	5	6	7	8	9	10	11	
		CASE 9	CASE 1	CASE 3	CASE 4	CASE 2	CASE 7	CASE 8	CASE 10	CASE 5	CASE 6	CASE 11	
04	SPRAY FLOW RATE T/Hr.	9.25	1.95	4.77	4.77	9.75	8.33	9.84	9.78	0.00	0.00	0.00	
05	SPRAY PR AT BLOCK VALVE INLET . Kg/cm <sup>2</sup> (a)	38	40.5	40.5	40.5	40.5	38	38	40.5	38	38	38	
06	SPRAY INLET TEMP. °C	44	40	40	40	40	44	44	40	44	44	44	

07	STEAM OUTLET FLOW RATE T/Hr.	110	102.0	57	57	117	99	117	117	0.00	0.00	0.00	
08	STEAM OUTLET PRESSURE Kg/cm <sup>2</sup> (a)	16	13.5	16	16	16	16	16	16	16	16	16	
09	STEAM OUTLET TEMP. °C	210	210	210	210	210	210	210	210	210	210	210	

NOTES:-

1.  $\Delta p$  DSH  $\rightarrow$  STEAM SIDE  $\Delta p$  ACROSS L.T.DESUPERHEATER
2. PRESSURE INDICATED ARE AT INLET OF SPRAY BLOCK VALVE.
3. THE PRESSURE DROP FROM INLET OF BLOCK VALVE (FD-43) TO BE SUITABLY APPORTIONED BETWEEN SPRAY BLOCK VALVE FD 43, FD-52 (FD-55) & DESH-01( LT DESUPERHEATER.)
4. THE OUTLET PRESSURE OF FD 52 (FD-55) SHALL CORRESPONDS TO SPRAY INLET PRESSURE OF DESH-01 ( LT DESUPERHEATER.)
5. THIS TO BE READ IN CONJUNCTION WITH DRG. 4-00-306-40444 FOR ADDITIONAL DATA FOR BLOCK VALVE SIZING FD 43.

PREPARED	CHECKED	APPROVED	DATE	DRG.No.	REV.
D.MATHANGI	SARAVANAN.C	R.PRABHA	13.08.2014	4-00-306-40438	SH.1 OF 1 00



NTPC-GADARWARA STPP STAGE-I (2x800MW)  
COMBINED PRDS VALVE SIZING DATA (AS-22)

S.No.	MEDIUM : SH STEAM	CONDITION								
		1	2	3	4	5	6	7	8	9
		CASE 3	CASE 4	CASE 7	CASE 8	CASE 9	CASE 10	CASE 1	CASE 2	CASE 11
01	STEAM FLOW RATE INLET T/Hr.	77.04	70.48	149.41	168.68	94.06	161.69	147.38	158.25	242.10
02	STEAM OPERATING INLET PR. Kg/cm <sup>2</sup> (a)	100	100	258	258	102.8	50	15	90	258
03	STEAM OPERATING INLET TEMP. °C	400	500	568	568	517	355	230	378	568

S.No.	MEDIUM : SPRAY WATER	CONDITION								
		1	2	3	4	5	6	7	8	8
		CASE 3	CASE 4	CASE 7	CASE 8	CASE 9	CASE 10	CASE 1	CASE 2	CASE 11
04	SPRAY WATER FLOW RATE T/Hr.	1.19	7.75	17.22	19.44	11.69	1.53	0.00	0.00	27.90
05	SPRAY WATER OPERATING PR. AT BLOCK VALVE INLET Kg/cm <sup>2</sup> (a)	40.5	40.5	38	38	38	40.5	40.5	40.5	38
06	SPRAY WATER OPERATING INLET TEMP. °C	40	40	44	44	44	40	40	40	44

07	STEAM OUTLET PRESSURE Kg/cm <sup>2</sup> (a)	16 +Δp DSH	16 +Δp DSH	16 +Δp DSH	16 +Δp DSH	16 +Δp DSH	16 +Δp DSH	15 +Δp DSH	16 +Δp DSH	16 +Δp DSH
08	STEAM OUTLET TEMP. °C	310	310	310	310	310	310	227.1	309.6	310
09	Cv REQUIRED	*	*	*	*	*	*	*	*	*
10	OPERATING NOISE LEVEL AT 1.0 METRE	<85dbA	<85dbA	<85dbA	<85dbA	<85dbA	<85dbA	<85dbA	<85dbA	<85dbA
11	OUTLET VELOCITY	*	*	*	*	*	*	*	*	*

**NOTES:-** 1. THIS SIZING TABLE TO BE USED FOR VALVE AS-22, SPRAY BLOCK VALVE (TAG No.FD 43),  
SPRAY CONTROL VALVE (TAG No.FD-48 & FD45).

2. \* BIDDER TO SPECIFY

3. Δp DSH → STEAM SIDE Δp ACROSS L.T.DESUPERHEATER

4. VALVE SELECTED SHALL BE CAPABLE OF PASSING 270 TPH OF STEAM & 28TPH OF SPRAY AT RATED PARAMETERS.

REV	DATE	ALTERED
01		APPROVED
ZONE		

PREPARED	CHECKED	APPROVED	DATE	DRG.No.	4-00-306-40439	SH. 1 OF 1	REV.
D.MATHANGI	SARAVANAN.C	R.PRABHA	13.08.2014				00



NTPC-GADARWARA STPP STAGE-I (2x800MW)  
 SIZING DATA FOR TURBINE GLAND SEALING DESUPERHEATER ( DESH-02 )  
 SPRAY TEMPERATURE CONTROL VALVE CDV-93

CUST. No: 7216&7217

S.No.	MEDIUM : SH STEAM	CONDITION			REMARKS
		1	2	3	
		CONDITION-1	CONDITION-2	MECH DESIGN	
01	STEAM FLOW RATE INLET T/Hr.	3.87	3.97	-	
02	STEAM OPERATING INLET PR. Kg/cm <sup>2</sup> (a)	16 +Δp DSH	16 +Δp DSH	21 +Δp DSH	
03	STEAM OPERATING INLET TEMP. °C	310	310	350	

S.No.	DESUPERHEATER OUTLET	CONDITION			REMARKS
		1	2	3	
		CONDITION-1	CONDITION-2	MECH DESIGN	
04	STEAM OUTLET FLOW RATE T/Hr.	4.0	4.0	-	
05	STEAM OUTLET PRESSURE Kg/cm <sup>2</sup> (a)	16	16	16	
06	STEAM OUTLET TEMP. °C	270	300	350	

S.No.	MEDIUM: SPRAY WATER	CONDITION			REMARKS
		1	2	3	
		CONDITION-1	CONDITION-2	MECH DESIGN	
07	SPRAY FLOW RATE T/Hr.	0.13	0.03	-	
08	SPRAY PR AT BLOCK VALVE INLET Kg/cm <sup>2</sup> (a)	32	35	46	
09	SPRAY INLET TEMP. °C	46.9	46.6	60	

**NOTES: -**

1. Δp DSH → STEAM SIDE Δp ACROSS DESUPERHEATER
2. THE OUTLET PRESSURE OF CDV-93 SHALL CORRESPONDS TO SPRAY INLET PRESSURE OF DESH-02 (DESUPERHEATER.)

PREPARED	CHECKED	APPROVED	DATE	DRG.No.	SH. 1 OF 1	REV.
SONALI	SARAVANAN C	R PRABHA	30.10.2014	4-00-306-40582		00