Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
PC: TSP: BARH:001 & 002	00	1 of 27

TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

NTPC BARH SUPER THERMAL POWER PROJECT
STAGE II (2 x 660 MW)-UNIT NOS. 4&5

CONTENTS

00	27.04.10	Fresh Issue	LALIT	R PRABHA	C SARAVANAN
Rev	Date	Alteration	Prepared	Approved(C&I)	Approved (Mech.)

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.

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.

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 PCV	TAG No.FD 30, FD 44
5. High capacity spray TCV	TAG No.FD 31, FD 28
6. Low capacity spray PCV	TAG No.FD 35, FD 38
7. Low capacity spray TCV	TAG No.FD 46, FD 47
8. LT Desuperheater	TAG No.DESH-01

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.

SECTION - III

EQUIPMENT SPECIFICATION

1. High capacity combined PRDS valve TAG No. AS 22	4-00-306-39216/REV00 (3 SHEETS)
2. Low capacity Pressure control valve TAG No. AS 26	4-00-306-39217/REV00 (3 SHEETS)
3. Common spray block valve TAG No. FD 43	4-00-306-39218/REV00 (3 SHEETS)
4. High capacity spray PCV TAG No.FD 30, FD 44	4-00-306-39219/REV00 (3 SHEETS)
5. High capacity spray TCV TAG No.FD 31, FD 28	4-00-306-39220/REV00 (3 SHEETS)
6. Low capacity spray PCV TAG No.FD 35, FD 38	4-00-306-39221/REV00 (3 SHEETS)
7. Low capacity spray TCV TAG No.FD 46, FD 47	4-00-306-39222/REV00 (3 SHEETS)
8. LT Desuperheater TAG No.DESH-01	4-00-306-39223/REV00 (1 SHEET)
9. Schematic Arrangement of Aux. PRDS station	4-00-301-39340/REV00 (1 SHEET)

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.

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 pressure 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.

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^2 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.

l10.0 Control valve Accessory Devices:

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.

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.

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.

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.

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.

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.

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.

TABLE-V-C
MANDATORY SPARES

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

2.2	Low capacity spray water line control valves. Valve trim including cage, plug, stem, seat rings, guide bushings, stem packing	1 for each Type, size and rating of valves	Number
3.0	Actuators & Assemblies		
	i) Actuator assembly		10% or 1 no. Each type, model And rating which ever is more
	ii) Diaphragms, O-rings, seals etc. of all type, make etc.		200% for each model
	iii) Pneumatic air filter/regulator of each type, make rating etc.		10% or 2 no. Whichever is more
	iv) Pressure gauges of all types, make rating etc.		10% or 2 no. Of each type Whichever is more
	v) Solenoid valves		10% or 2 no. Of each type Whichever is more
	vi) Positioner unit		20% or 2 no. Of each type Whichever is more

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 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 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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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 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: i) Names of all parts	

	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).	
3.0	Minimum the following parts to be covered if applicable. a) Body b) Bonnet, Cap c) Disc d) Stem e) Plug f) Disc seat	
	g) Stem guide h) Gasket i) Gland packing j) Bolts & studs k) Nuts l) Hand wheel	

	iii) Weight of all parts iv) Erection, commissioning and Mandatory Spares identification along with their Quantity. v) Weight of valve & actuator separately Total weight and flooded weight vi) Class rating as per ASME B16.34 vii) Make & Country of Manufacture viii) Actuator Make & Type ix) End connection details	
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).	

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

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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

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)

" PURPOSELY LEFT AS BLANK "

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

	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.					
	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	Reproducible of drawings in sl no: 1.0 & 2.0		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-BARH STPP-I,STAGE-II,UNIT NO.4&5(2X660 MW) CUST.No: 7003&7004

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION PC: TSP: BARH: 001&002

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 : 1 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 ☐ NPI ☐ Flanged ☐ ANSI ☐ — BW ☑ (Steam side) BSPT ☐ ☐ DIN ☐ — SW ☑ (Spray side) BS ☐ ☐

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 :
27. Disc material :
28. stem guide material :

410/CoCr-A OR EQUIVALENT

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 of valve. : Stayput ☑ 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 furnished and shall comply with annexure-I specification. : NAPL

REV	DATE	ALTERATION	PREPARED	APPD./C&I	APPROVED
00	26.03.10	FRESH ISSUE	LALIT	R.PRABHA	C.SARVANAN

NTPC DOC NO. 9560-102-01-PC-PVI-Y-107

DRG. NO: 4-00-306-39216 REV 00

POSITIONER:

38. Type : Pneumatic ☐ Electronic ☐
DA/RA Electro Pneumatic (SMART)* ☑

* **ONE NUMBER OF SOFTWARE (CAPABLE OF HANDLING 1 TAG AT A TIME WITH HART MODEM) PER BOILER TO BE SUPPLIED ALONG WITH SMART POSITIONER**

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 : Pnuematic : ☐ 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 : 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^2 (a)
64. Operating inlet temperature in °C
65. Outlet pressure in Kg/cm^2 (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. 4–00–306–39215 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all	conditions)	

26.03.10	LALIT	R.PRABHA	C.SARAVANAN
DATE	PREPARED	APPD./C&I	APPROVED

DRG. NO: 4–00–306–39216 REV 00

DESIGN DATA:

		(A) Steam	(B) Spray	
70.	Design Pressure Kg/cm^2(g)	269	350	*
71.	Design Temperature °C	: 573	200	*
72.	Rated/Design/Selected Cv of valve	: *		
73.	Velocity restriction : *			
74.	Operating lift restriction : 10 to 80 % .			

* MAX.CLASS RATING BETWEEN (A) & (B) SHALL BE THE CLASS RATING FOR THE TOTAL VALVE

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:

79.	Hydraulic test report	: Yes	☑	No	☐		
80.	Radiography : Critical Parts	:	☑	Total	☐		
	Not required	:	☐		☐		
81.	IBR test report : Reqd.	:	☑		☐		
82.	Type test : Capacity Evoluation 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
2. ** VIDEO MANUAL PREFERRED.

26.03.10	LALIT	R.PRABHA	C.SARAVANAN	DRG. NO: 4-00-306-39216	REV 00
DATE	PREPARED	APPD./C&I	APPROVED		

CI 12/A

CONTROL VALVE SPECIFICATION SHEET

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

PROJECT:
NTPC-BARH STPP-I,STAGE-II,UNIT NO.4&5(2X660 MW) CUST.No: 7003&7004

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION PC: TSP: BARH: 001&002

1. Valve tag No. AS-26
2. Service : Low capacity Pressure Control valve
3. Line No./Vessel No. :
4. Qty. required per unit : ONE
5. Manufacturer : *
6. Model No. : *
7. Rating : ASME CL. 800
8. Total Qty Required : 1 No

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 168.3X7.11 Outlet : OD 273X12.7
14. Body rating : ASME CL. 600
16. Bonnet type : Standard ☐ Finned ☑ Extended ☑ Pr. seal ☐ ☐
17. Material : Body : ASTM A 216 Gr WCB 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 ☐ NPI ☐ Flanged ☐ ANSI ☐ BW ☑ BSPT ☐ ☐ DIN ☐ SW ☐ BS ☐ ☐

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 :
27. Disc material :
28. stem guide material :

17.4 PH SST / SS 316 OR EQUIVALENT

29. --

ACTUATOR:

30. Type : Electric ☐ Pneumatic ☑ ✓ Hydraulic ☐ DA/RA(Air To Close)
31. Size : *
32. Supply : 45 PSIG
33. Failsafe position of valve. : Stayput ☑ 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 furnished and shall comply with annexure-I specification. : NAPL

REV	DATE	ALTERATION	PREPARED	APPD./C&I	APPROVED
00	26.03.10	FRESH ISSUE	LALIT	R.PRABHA	C.SARAVANAN

NTPC DOC NO. 0260-101-01-PC-PVI-Y-008

DRG. NO: 4-00-306-39217 REV 00

POSITIONER:

38. Type : Pneumatic ☐ Electronic ☐
DA/RA Electro Pneumatic (SMART) ☑

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 : Pnuematic : ☐ 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^2 (a)
64. Operating inlet temperature in °C
65. Outlet pressure in Kg/cm^2 (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. 4–00–306–39213 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all conditions)		

DATE	PREPARED	APPD./C&I	APPROVED
26.03.10	LALIT	R.PRABHA	C.SARVANAN

DRG. NO: 4–00–306–39217 REV 00

DESIGN DATA:

70. Design Pressure Kg/cm^2(g) : 73.1 Kg/Cm^2 (g)
71. Design Temperature °C : 365 °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:

79. Hydraulic test report : Yes ☑ No ☐
80. Radiography : Critical Parts : ☑ Total ☐
Not required : ☐ ☐
81. IBR test report : Reqd. : ☑ ☐
82. Type test : Capacity Evoluation 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

26.03.10	LALIT	R.PRABHA	C.SARAVANAN	DRG. NO: 4-00-306-39217	REV 00
DATE	PREPARED	APPD./C&I	APPROVED		

CI 12/A

CONTROL VALVE SPECIFICATION SHEET

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

PROJECT: NTPC-BARH STPP-I,STAGE-II,UNIT NO.4&5(2X660 MW) CUST.No: 7003&7004

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION PC: TSP: BARH: 001&002

1. Valve tag No. : FD-43
2. Service : Common Spray Block valve
3. Line No./Vessel No. :
4. Qty. required per unit : ONE
5. Manufacturer : *
6. Model No. : *
7. Rating : ASME CL.2500
8. Total Qty Required : 1 No

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 88.9X15.24 Outlet : OD 88.9X15.24
14. Body rating : ASME CL.2500
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 ☐ NPI ☐ Flanged ☐ ANSI ☐ BW ☐ BSPT ☐ DIN ☐ SW ☑ BS ☐

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 :
28. stem guide material : } 17.4 PH SST/416C SST OR EQUIVALENT
29. --

ACTUATOR:

30. Type : Electric ☐ Pneumatic ☑ Hydraulic ☐ DA/RA(Air To Close) ✓
31. Size : *
32. Supply : 45 PSIG
33. Failsafe position of valve. : Stayput ☑ 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 furnished and shall comply with annexure-I specification. : NAPL

REV	DATE	ALTERATION	PREPARED	APPD./C&I	APPROVED
00	26.03.10	FRESH ISSUE	LALIT	R.PRABHA	C.SARAVANAN

NTPC DOC NO. 9560-102-01-PC-PVI-Y-110

DRG. NO: 4-00-306-39218 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 : Pnuematic : ☐ 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 : 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^2 (a)
64. Operating inlet temperature in °C
65. Outlet pressure in Kg/cm^2 (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. 4–00–306–39214 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all conditions)		

DATE	PREPARED	APPD./C&I	APPROVED
26.03.10	LALIT	R.PRABHA	C.KARUNAKARAN

DRG. NO: 4–00–306–39218 REV 00

DESIGN DATA:

70. Design Pressure Kg/cm^2(g) : 350 Kg/Cm^2 (g)
71. Design Temperature °C : 200
72. Rated/Design/Selected Cv of valve : *
73. Velocity restriction : *
74. Operating lift restriction : –
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 : Reqd. : ☑ ☐
82. Type test : Capacity Evoluation 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

DATE	PREPARED	APPD./C&I	APPROVED	DRG. NO:	REV
26.03.10	LALIT	R.PRABHA	C.SARAVANAN	4–00–306–39218	00

CI 12/A

CONTROL VALVE SPECIFICATION SHEET

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

PROJECT: NTPC-BARH STPP-I,STAGE-II,UNIT NO.4&5(2X660 MW)

CUST.No: 7003&7004

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION PC: TSP: BARH: 001&002

1. Valve tag No. : FD-30 & FD-44
2. Service : High capacity Spray Pressure Control valve
3. Line No./Vessel No. :
4. Qty. required per unit : ONE EACH
5. Manufacturer : *
6. Model No. : *
7. Rating : ASME CL. 2500
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 88.9X15.24 Outlet : OD 88.9X15.24
14. Body rating : ASME CL.2500
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 ☐ NPI ☐ Flanged ☐ ANSI ☐ BW ☐ BSPT ☐ DIN ☐ SW ☑ BS ☐

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 : 316 SST Strain Hardened
25. Plug material :
26. Seat material :
27. Disc material :
28. stem guide material : } 17.4 PH SST/ 440 SST OR EQUIVALENT
29. --

ACTUATOR:

30. Type : Electric ☐ Pneumatic ☑ Hydraulic ☐ DA/RA(Air To Close) ✓
31. Size : *
32. Supply : 45 PSIG
33. Failsafe position of valve. : Stayput ☑ 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 furnished and shall comply with annexure-I specification. : NAPL

REV	DATE	ALTERATION	PREPARED	APPD./C&I	APPROVED
00	26.03.10	FRESH ISSUE	LALIT	R.PRABHA	C.SARAVANAN

NTPC DOC NO. 9560-102-01-PC-PVI-Y-109

DRG. NO: 4-00-306-39219 REV 00

POSITIONER:

38. Type : Pneumatic ☐ Electronic ☐
DA/RA Electro Pneumatic (SMART) ☑

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 : Pnuematic : ☐ 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 % 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^2 (a)
64. Operating inlet temperature in °C
65. Outlet pressure in Kg/cm^2 (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. 4–00–306–39215 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all conditions)		

DATE	PREPARED	APPD./C&I	APPROVED
26.03.10	LALIT	R.PRABHA	C.SARAVANAN

DRG. NO: 4–00–306–39219 REV 00

DESIGN DATA:

70. Design Pressure $Kg/cm^2(g)$: 350 Kg/Cm^2 (g)
71. Design Temperature °C : 200 °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 : Reqd. : ☑ ☐
82. Type test : Capacity Evoluation 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

26.03.10	LALIT	R.PRABHA	C.SARAVANAN	DRG. NO: 4-00-306-39219	REV 00
DATE	PREPARED	APPD./C&I	APPROVED		

CI 12/A

CONTROL VALVE SPECIFICATION SHEET

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

PROJECT: NTPC-BARH STPP-I,STAGE-II,UNIT NO.4&5(2X660 MW)

CUST.No: 7003&7004

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION PC: TSP: VALLUR: 001&002

1. Valve tag No. : FD-31&FD-28
2. Service : High capacity Spray Temperature Control valve
3. Line No./Vessel No. :
4. Qty. required per unit : ONE EACH
5. Manufacturer : *
6. Model No. : *
7. Rating : ASME CL.2500
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 88.9X15.24 Outlet : OD 88.9X15.24
14. Body rating : ASME CL.2500
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 ☐ NPI ☐ Flanged ☐ ANSI ☐ BW ☐ BSPT ☐ DIN ☐ SW ☑ BS ☐

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 : 316 SST Strain Hardened
25. Plug material :
26. Seat material :
27. Disc material :
28. stem guide material : } 17.4 PH SST/ 440C SST OR EQUIVALENT
29. --

ACTUATOR:

30. Type : Electric ☐ Pneumatic ☑ Hydraulic ☐ DA/RA(Air To Close)
31. Size : *
32. Supply : 45 PSIG
33. Failsafe position of valve. : Stayput ☑ 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 furnished and shall comply with annexure-I specification. : NAPL

REV	DATE	ALTERATION	PREPARED	APPD./C&I	APPROVED
00	26.03.10	FRESH ISSUE	LALIT	R.PRABHA	C.SARAVANAN

NTPC DOC NO. 9560-102-01-PC-PVI-Y-112

DRG. NO: 4-00-306-39220 REV 00

POSITIONER:

38. Type : Pneumatic ☐ Electronic ☐
DA/RA Electro Pneumatic (SMART) ☑

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 : Pnuematic : ☐ 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 % 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^2 (a)
64. Operating inlet temperature in °C
65. Outlet pressure in Kg/cm^2 (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. 4–00–306–39215 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all	conditions)	

DATE	PREPARED	APPD./C&I	APPROVED	DRG. NO:	REV
26.03.10	LALIT	R.PRABHA	C.SARAVANAN	4–00–306–39220	00

DESIGN DATA:

70. Design Pressure Kg/cm^2(g) : 350 Kg/Cm^2 (g)
71. Design Temperature °C : 200 °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 : Reqd. : ☑ ☐
82. Type test : Capacity Evoluation 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

26.03.10	LALIT	R.PRABHA	C.SARAVANAN	DRG. NO: 4-00-306-39220	REV 00
DATE	PREPARED	APPD./C&I	APPROVED		

CI 12/A

CONTROL VALVE SPECIFICATION SHEET

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

PROJECT: NTPC-BARH STPP-I,STAGE-II,UNIT NO.4&5(2X660 MW)

CUST.No: 7003&7004

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION PC: TSP: BARH: 001&002

1. Valve tag No. : FD-35 & FD-38
2. Service : Low capacity Spray Pressure Control valve
3. Line No./Vessel No. :
4. Qty. required per unit : ONE EACH
5. Manufacturer : *
6. Model No. : *
7. Rating : ASME CI 2500
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 60.3 x 11.07 Outlet : OD 60.3 x 11.07
14. Body rating : ASME CI 2500
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 %
23. Guiding : Cage ☑ Port ☐ Top ☐ Bottom ☐
24. Stem material :
25. Plug material :
26. Seat material :
27. Disc material :
28. stem guide material :

17.4 PH SS / SS 316 OR EQUIVALENT

29. --

ACTUATOR:

30. Type : Electric ☐ Pneumatic ☑ Hydraulic ☐ DA/RA(Air To Close) ✓
31. Size : *
32. Supply : 45 PSIG
33. Failsafe position of valve. : Stayput ☑ 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 furnished and shall comply with annexure-I specification. : NAPL

REV	DATE	ALTERATION	PREPARED	APPD./C&I	APPROVED
00	26.03.10	FRESH ISSUE	LALIT	R.PRABHA	C.SARAVANAN

NTPC DOC NO. 9560-102-01-PC-PVI-Y-108

DRG. NO: 4-00-306-39221 REV 00

POSITIONER:

38. Type : Pneumatic ☐ Electronic ☐
DA/RA Electro Pneumatic (SMART) ☑

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 : Pnuematic : ☐ 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 % 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^2 (a)
64. Operating inlet temperature in °C
65. Outlet pressure in Kg/cm^2 (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. 4–00–306–39214 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all conditions)		

DATE	PREPARED	APPD./C&I	APPROVED
26.03.10	LALIT	R.PRABHA	C.SARAVANAN

DRG. NO: 4–00–306–39221 REV 00

DESIGN DATA:

70. Design Pressure Kg/cm^2(g) : 350 Kg/Cm^2 (g)
71. Design Temperature °C : 200 °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 : Reqd. : ☑ ☐
82. Type test : Capacity Evoluation 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

26.03.10	LALIT	R.PRABHA	C.SARVANAN	DRG. NO: 4-00-306-39221	REV 00
DATE	PREPARED	APPD./C&I	APPROVED		

CI 12/A

CONTROL VALVE SPECIFICATION SHEET

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

PROJECT: NTPC-BARH STPP-I,STAGE-II,UNIT NO.4&5(2X660 MW)

CUST.No: 7003&7004

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION PC: TSP: BARH: 001&002

1. Valve tag No. : FD-46 & FD-47
2. Service : Low capacity Spray Temperature Control valve
3. Line No./Vessel No. :
4. Qty. required per unit : ONE EACH
5. Manufacturer : *
6. Model No. : *
7. Rating : ASME Cl 2500
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 60.3 x 11.07 Outlet : OD 60.3 x 11.07
14. Body rating : ASME Cl 2500
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 :

17.4 PH SS / SS 316 OR EQUIVALENT

29. --

ACTUATOR:

30. Type : Electric ☐ Pneumatic ☑ Hydraulic ☐ DA/RA(Air To Close)
31. Size : *
32. Supply : 45 PSIG
33. Failsafe position of valve. : Stayput ☑ 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 furnished and shall comply with annexure-I specification. : NAPL

REV	DATE	ALTERATION	PREPARED	APPD./C&I	APPROVED
00	26.03.10	FRESH ISSUE	LALIT	R.PRABHA	C.SARAVANAN

NTPC DOC NO. 9560-102-01-PC-PVI-Y-

DRG. NO: 4-00-306-39222 REV 00

POSITIONER:

38. Type : Pneumatic ☐ Electronic ☐
DA/RA Electro Pneumatic (SMART) ☑

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 : Pnuematic : ☐ 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 % 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^2 (a)
64. Operating inlet temperature in °C
65. Outlet pressure in Kg/cm^2 (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. 4–00–306–38548 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all	coditions)	

DATE	PREPARED	APPD./C&I	APPROVED
26.03.10	LALIT	R.PRABHA	C.SARAVANAN

DRG. NO: 4–00–306–39222 REV 00

POSITIONER:

38. Type : Pneumatic ☐ Electronic ☐
DA/RA Electro Pneumatic (SMART) ☑
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 : Pnuematic : ☐ 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 % 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^2 (a)
64. Operating inlet temperature in °C
65. Outlet pressure in Kg/cm^2 (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. 4–00–306–38548 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all coditions)		

DATE	PREPARED	APPD./C&I	APPROVED
26.03.10	LALIT	R.PRABHA	C.SARAVANAN

DRG. NO: 4–00–306–39222 REV 00

NTPC

BARH STPP–I,STAGE–II,UNIT NO.4&5(2X660 MW)

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 (Steam side)	: ø457 x 9.53 ø457 x 9.53
06.	End connection (Steam side)	: Butt Welded
07.	Spray water connection	: OD 60.3 x 11.07
08.	End connection	: Butt Welded / Socket Welded
09.	Mounting arrangement	: Vertical / Horizontal
10.	Minimum straight length required U/S of Desuperheater	: Bidder to specify.
11.	Minimum distance required downstream of DSH	: Bidder to specify.
12.	Sizing Parameters	: Refer Drg. No. 4–00–306–39034
13 .	Design Pressure	: 20 Kg / cm^2 (g)
14.	Design Temperature	: 350 °C
15.	Minimum distance required in D/S of DESH for temp. control sensing element	: Bidder to specify.
16.	Minimum distance required in D/S of DESH for pressure control sensing element	: Bidder to specify.
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 specification, Weight,Final sizing, Turn down ratio calculation, Testcertificates as per QP and O & M manual. — 20 sets plus 2 sets on CD

26.05.10	LALIT	R.PRABHA	C.SARAVANAN	DRG. NO: 4–00–306–39223	REV 00
DATE	PREPARED	APPD./C&I	APPROVED		

CUST. No: 7003&7004

NTPC-BARH STPP-I,STAGE-II,UNIT NO.4&5(2X660 MW)

STEAM GENERATOR WITH ELECTROSTATIC PRECIPITATOR PACKAGE

LOW CAPACITY PRV SIZING DATA (AS-26)

S.No.	MEDIUM : SH STEAM		CONDITION					
			1	2	3	4		
			CASE 5 MSP@40%	CASE 5 PSP@40%	CASE 5 @100%	CASE 6 @100%		
01	STEAM FLOW RATE	T/Hr.	22.42	22.27	23.08	27.17		
02	STEAM OPERATING INLET PR.	$Kg/cm^2(a)$	23	23	55.87	55.87		
03	STEAM OPERATING INLET TEMP.	°C	337	345	335.6	335.6		
04	STEAM OUTLET PRESSURE	$Kg/cm^2(a)$	16 +Δp DSH	16 +Δp DSH	16 +Δp DSH	16 +Δp DSH		
05	STEAM OUTLET TEMP.	°C	330.12	338.47	291.75	291.75		
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
3. PSP DENOTES PURE SLIDING PRESSURE & MSP DENOTES MODIFIED SLIDING PRESSURE

PREPARED	CHECKED	APPROVED	DATE	DRG.No.	SH. 1 OF 1	REV.
LALIT	C.SARAVANAN	C.SARAVANAN	26.03.10	4-00-306-39213		00

CUST. No: 7003&7004

NTPC-BARH STPP-I,STAGE-II,UNIT NO.4&5(2X660 MW)
STEAM GENERATOR WITH ELECTROSTATIC PRECIPITATOR PACKAGE
SIZING DATA FOR LT DESUPERHEATER(DESH-01),FD43,FD35(FD38) & FD46(FD47)

S.No.	MEDIUM : SH STEAM		CONDITION										REMARKS
			1	2	3	4	5	6	7				
			CASE 5 PSP@40%	CASE 6 @100%	CASE 9 SP@40%	CASE 1	CASE 4	CASE 2	CASE 8 MSP				
01	STEAM FLOW RATE INLET	T/Hr.	22.27	27.17	111.20	103.64	163.21	115.64	162.81				
02	STEAM OPERATING INLET PR.	$Kg/cm^2(a)$	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	338.41	291.75	336.41	310	310	310	310				

S.No.	MEDIUM : SPRAY WATER		CONDITION										REMARKS
			1	2	3	4	5	6	7				
			CASE 5 PSP@40%	CASE 6 @100%	CASE 9 SP@40%	CASE 1	CASE 4	CASE 2	CASE 8 MSP				
04	SPRAY FLOW RATE	T/Hr.	3.13	2.73	12.5	10.66	18.08	11.89	19.78				
05	SPRAY PR AT BLOCK VALVE INLET .	$Kg/cm^2(a)$	108	308	108	75	100	75	308				
06	SPRAY INLET TEMP.	°C	157	192	157	111	150	111	192				
07	STEAM OUTLET FLOW RATE	T/Hr.	25.40	29.90	123.7	114.3	181.29	127.44	182.59				
08	STEAM OUTLET PRESSURE	$Kg/cm^2(a)$	16	16	16	16	16	16	16				
09	STEAM OUTLET TEMP.	°C	210	210	210	210	210	210	210				

NOTES:-

1. Δp DSH→← STEAM SIDE Δp ACROSS L.T.DESUPERHEATER
2. PRESSURE INDICATED ARE AT INLET OF SPRAY BLOCK VALVE.
3. PRESSURE AT D/S OF SPRAY FDV-35 (FD-38) TO BE MAINTAINED AT 80 $Kg/cm^2(a)$
4. THE PRESSURE DROP FROM INLET OF BLOCK VALVE (FD-43) TO BE SUITABLY APPORTIONED BETWEEN SPRAY BLOCK VALVE FD 43, FD-35 (FD-38),FD-46 (FD-47) & DESH-01(LT DESUPERHEATER.)
5. THE OUTLET PRESSURE OF FD 46 (FD-47) SHALL CORRESPONDS TO SPRAY INLET PRESSURE OF DESH-01 (LT DESUPERHEATER.)
6. THIS TO BE READ IN CONJUCTION WITH DRG. 4-00-306-39034 FOR ADDITIONAL DATA FOR BLOCK VALVE SIZING FD 43.
7. PSP DENOTES PURE SLIDING PRESSURE & MSP DENOTES MODIFIED SLIDING PRESSURE

PREPARED	CHECKED	APPROVED	DATE	DRG.No.	SH. 1 OF 1	REV.
LALIT	C.SARAVANAN	C.SARAVANAN	23.03.10	4-00-306-39214		00

CUST. No: 7003&7004

NTPC-BARH STPP-I,STAGE-II,UNIT NO.4&5(2X660 MW)

STEAM GENERATOR WITH ELECTROSTATIC PRECIPITATOR PACKAGE

COMBINED PRDS VALVE SIZING DATA (AS-22)

S.No.	MEDIUM : SH STEAM		CONDITION								
			1	2	3	4	5	6	7	8	9
			CASE 1	CASE 4	CASE 2	CASE 7 PSP	CASE 7 MSP	CASE 8 PSP	CASE 8 MSP	CASE 9 PSP	CASE 9 MSP
01	STEAM FLOW RATE INLET	T/Hr.	136.10	169.13	158.84	174.73	184.02	213.59	224.96	96.10	96.30
02	STEAM OPERATING INLET PR.	$Kg/cm^2(a)$	43	107	94	100	247	100	247	95	100
03	STEAM OPERATING INLET TEMP.	°C	360	490	390	565	565	565	565	565	565

S.No.	MEDIUM : SPRAY WATER		CONDITION								
			1	2	3	4	5	6	7	6	7
			CASE 1	CASE 4	CASE 2	CASE 7 PSP	CASE 7 MSP	CASE 8 PSP	CASE 8 MSP	CASE 9 PSP	CASE 9 MSP
04	SPRAY WATER FLOW RATE	T/Hr.	2.93	19.78	1.66	37.57	28.27	45.92	34.56	19.46	19.30
05	SPRAY WATER OPERATING PR. AT BLOCK VALVE INLET	$Kg/cm^2(a)$	75	100	75	308	308	308	308	108	108
06	SPRAY WATER OPERATING INLET TEMP.	°C	111	150	111	192	192	192	192	157	157
07	STEAM OUTLET PRESSURE	$Kg/cm^2(a)$	16 $+\Delta p$ DSH	16 $+\Delta p$ DSH	16 $+\Delta p$ DSH	16 $+\Delta p$ DSH	16 $+\Delta p$ DSH	16 $+\Delta p$ DSH	16 $\pm\Delta p$ DSH	16 + p DSH	16 $+\Delta p$ DSH
08	STEAM OUTLET TEMP.	°C	310	310	310	310	310	310	310	310	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 PCV (TAG No.FD-30 & FD44) AND SPRAY TCV (TAG No.FD-31 & FD28).
2. DOWNSTREAM OF SPRAY PCV SHALL BE MAINTAINED AT 80 $Kg/cm^2(a)$. HOWEVER WHEN SPRAY INLET PRESSURE ITSELF IS LESS THAN 80$Kg/cm^2(a)$, SPRAY PCV & BLOCK VALVE SHALL BE AT FULL OPEN & INLET PRESSURE OF TCV WILL BE SAME AS SPRAY INLET PRESSURE.
3. * BIDDER TO SPECIFY
4. Δp DSH → STEAM SIDE Δp ACROSS L.T.DESUPERHEATER
5. PSP DENOTES PURE SLIDING PRESSURE & MSP DENOTES MODIFIED SLIDING PRESSURE

PREPARED	CHECKED	APPROVED	DATE	DRG.No.		REV.
LALIT	C.SARAVANAN	C.SARAVANAN	20.03.10	4-00-306-39215	SH. 1 OF 1	01

FIRST ANGLE PROJECTION(ALL DIMENSIONS IN MILLIMETRES)

DRAWING NO 4-00-306-39340

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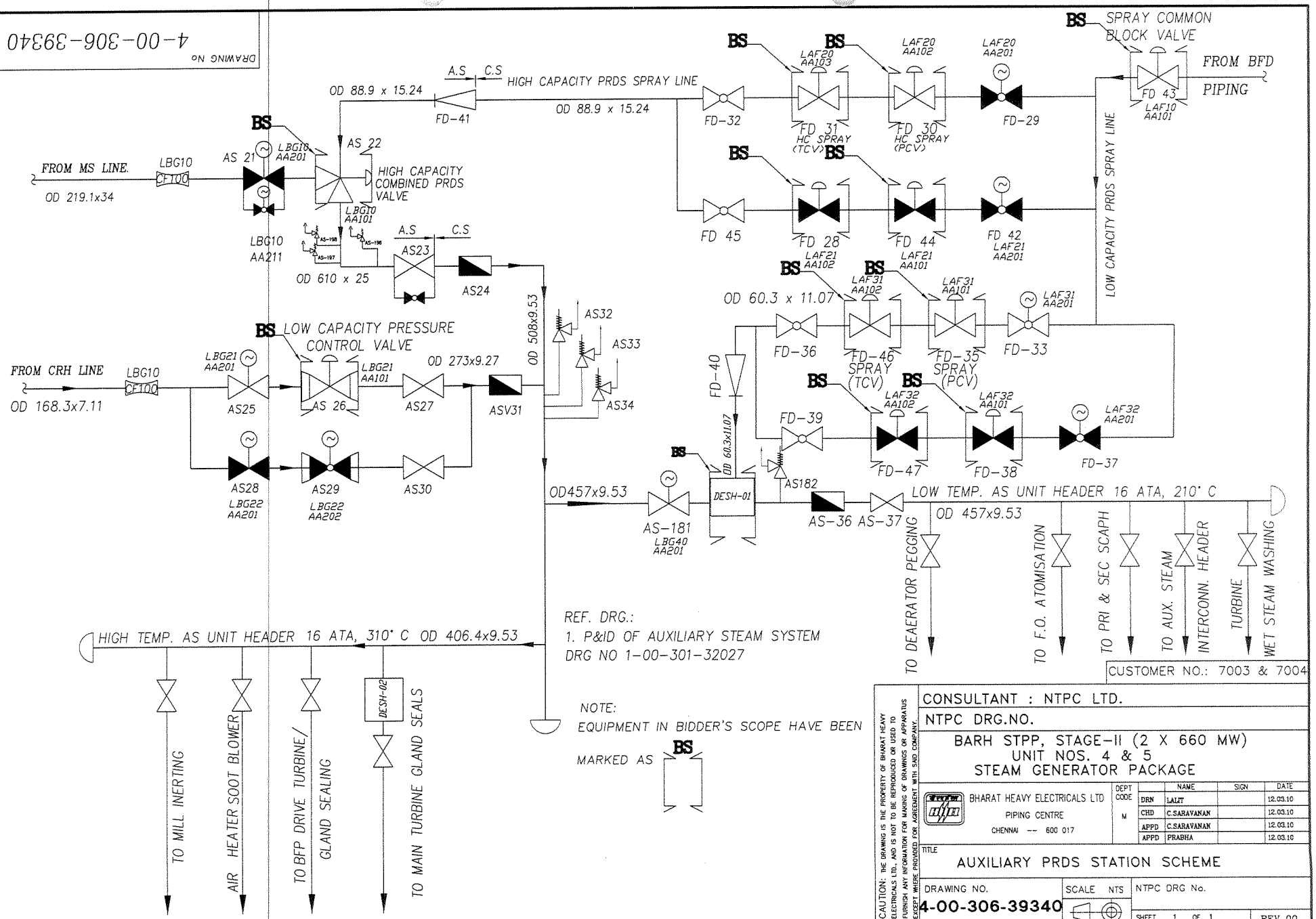

CUSTOMER NO.: 7003 & 7004

CONSULTANT : NTPC LTD.

NTPC DRG.NO.

BARH STPP, STAGE-II (2 X 660 MW)
UNIT NOS. 4 & 5
STEAM GENERATOR PACKAGE

BHARAT HEAVY ELECTRICALS LTD
PIPING CENTRE
CHENNAI -- 600 017

DEPT CODE		NAME	SIGN	DATE
M	DRN	LALIT		12.03.10
	CHD	C.SARAVANAN		12.03.10
	APPD	C.SARAVANAN		12.03.10
	APPD	PRABHA		12.03.10

TITLE
AUXILIARY PRDS STATION SCHEME

DRAWING NO. 4-00-306-39340

SCALE NTS

NTPC DRG No.

SHEET 1 OF 1

REV 00

SIZE A4

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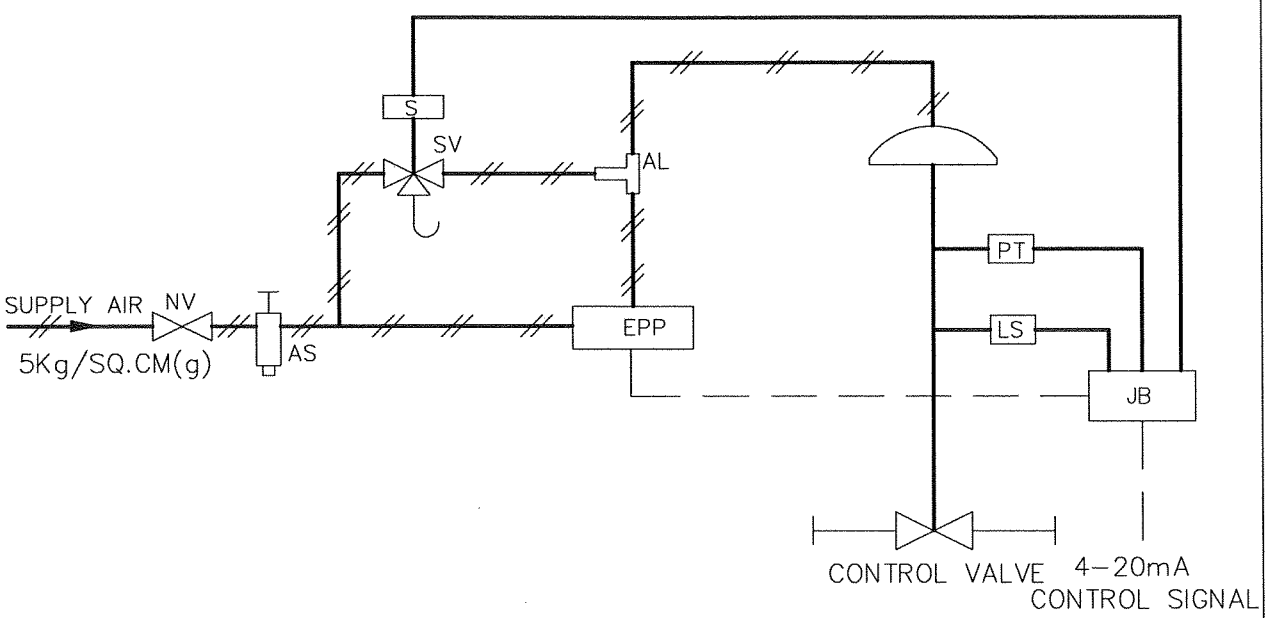
53 of 56

Bharat Heavy Electricals Limited
Piping Centre Chennai-17

NTPC, BARH STPP, STAGE-II (2X660MW)	Specification No.	Rev.No.	Sheet No.
	PC:TSP:BARH:003	00	01 OF 01

PNEUMATIC HOOK UP DIAGRAM FOR CONTROL VALVE



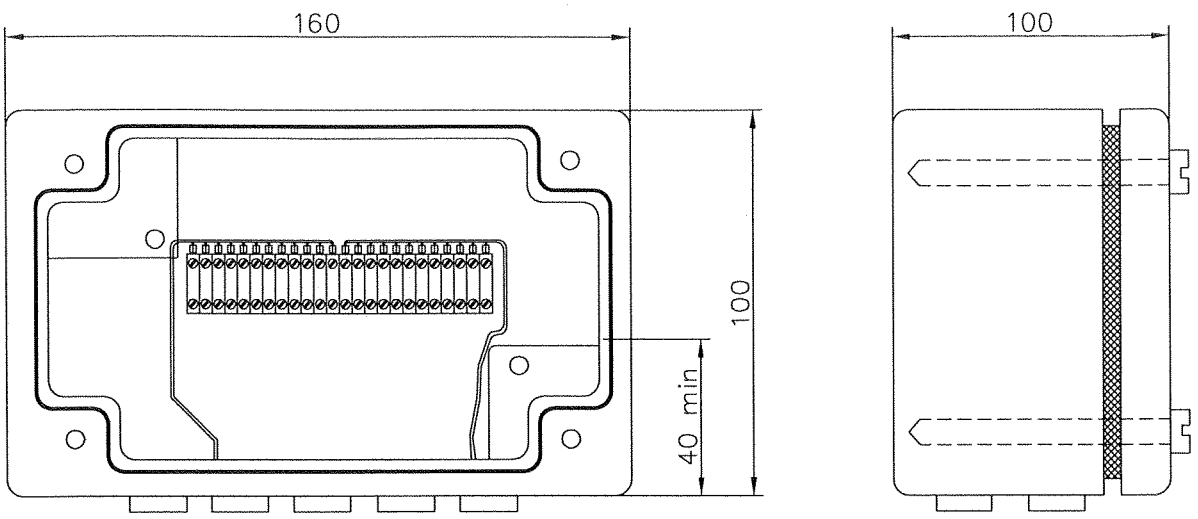
EPP –ELECTRO PNEUMATIC POSITIONER SMART TYPE
AS – AIR SET
AL – AIR LOCK
PT – SMART POSITIONER
JB – JUNCTION BOX
LS – OPEN & CLOSE LIMIT SWITCHES
NV – BRASS ISOLATION VALVE
SV – SOLENOID VALVE
S – SOLENOID COIL

NOTE:
i) ALL REQUIRED FITTINGS SHALL BE PROVIDED BY VENDOR.
ii) SIZE OF VALVES / FITTINGS SHALL BE INDICATED BY VENDOR.

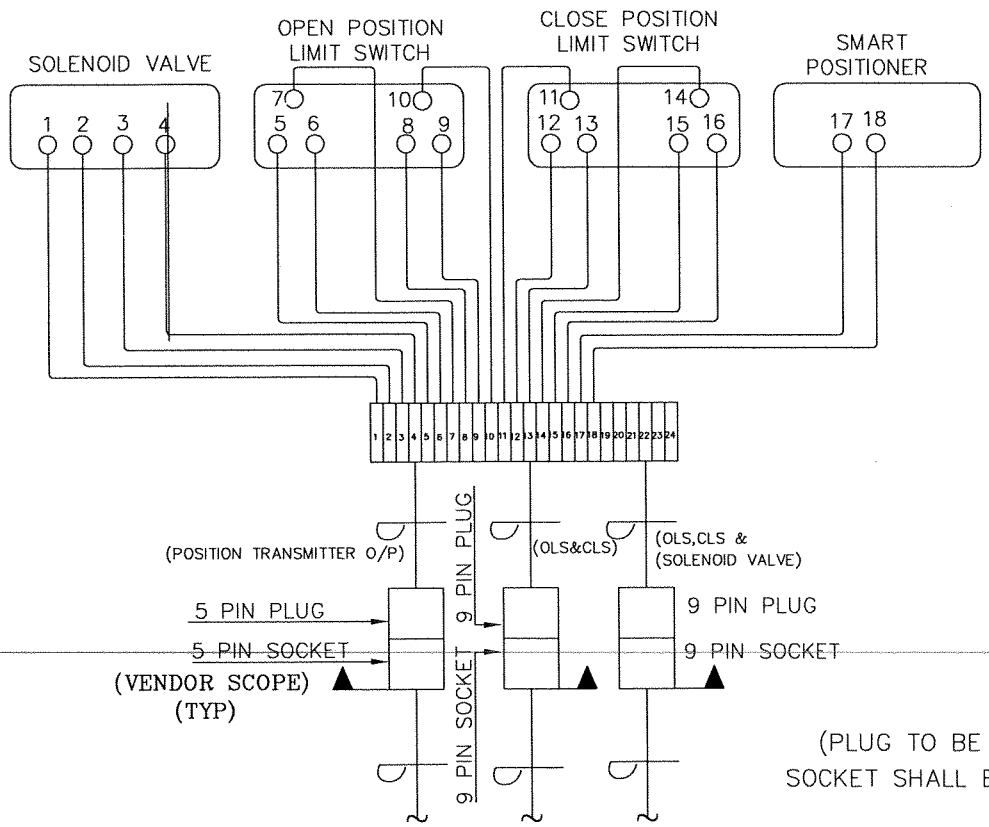
PREPARED	CHECKED	APPROVED	DATE
LALIT	R. PRABHA	C.SARAVANAN	10.04.10

Bharat Heavy Electricals Limited
Piping Centre Chennai-17

NTPC, BARH STPP, STAGE-II (2X660MW)	Specification No.	Rev.No.	Sheet No.
	PC:TSP:BARH:004	00	01 OF 02



JUNCTION BOX



(PLUG TO BE WIRED TO JUNCTION BOX. SOCKET SHALL BE SUPPLIED IN LOOSE).

TERMINAL BOX WIRING DIAGRAM

PREPARED	CHECKED	APPROVED	DATE
LALIT	R. PRABHA	C.SARAVANAN	10.04.10

Bharat Heavy Electricals Limited
Piping Centre Chennai-17

NTPC, BARH STPP, STAGE-II (2X660MW)	Specification No.	Rev.No.	Sheet No.
	PC:TSP:BARH:004	00	02 OF 02

NOTE:-

1. ELMEX TERMINAL BLOCKS SHALL BE USED IN THE JUNCTION BOX.
2. THE VALVE MANUFACTURER SHALL DO THE WIRING AS SHOWN IN THIS DRAWING. TERMINATION SHALL BE DONE BY USING SUITABLE CRIMPING LUGS.
3. THE JUNCTION BOX SHALL BE MOUNTED SUITABLY ON THE VALVE FOR EASY ACCESSIBILITY.
4. MATERIAL OF JUNCTION BOX : ALUMINIUM.
5. THE JUNCTION BOX SHALL HAVE IP55 CLASS OF ENCLOSURE PROTECTION.
6. I) FROM THE SMART POSITIONER TO THE JUNCTION BOX: THE CABLE SHALL ENTER THROUGH DOUBLE COMPRESSION TYPE BRASS CHROME PLATED CABLE GLAND SUITABLE FOR 0.5 SQ.MM TYPE–F INSTRUMENTATION CABLE . SUITABLE CABLE GLAND TO BE PROVIDED IN THE JUNCTION BOX.

   II) THE CABLING FROM JUNCTION BOX TO REMOTE CONTROL(DDCMIS): 5 PIN PLUG AND SOCKET SUITABLE FOR 2 PAIR F– TYPE INSTRUMENTATION CABLE TO IS BE PROVIDED IN THE JUNCTION BOX .

   III) FOR THE SOLENOID VALVE COMMAND FROM REMOTE CONTROL(DDCMIS): CABLE GLAND SUITABLE FOR 0.5 SQ.MM TYPE–G INSTRUMENTATION CABLE, 4 PAIR TO BE SUPPLIED IN THE JUNCTION BOX.
7. FLEXIBLE CONDUIT SHALL BE USED AND CONNECTED TO SUITABLE END CONNECTORS & PVC SEALED AT BOTH ENDS USING SUITABLE SEALANT. (EPOXY OR EQUIVALENT)
8. CONDUIT ENTRIES ARE PROVIDED ONLY AT THE BOTTOM.
9. MINIMUM GAP OF 25 MM IS TO BE LEFT BETWEEN THE TERMINALS OF ELECTRONIC SMART POSITIONER & SOLENOID VALVE.
10. THE JUNCTION BOX SHALL HAVE EARTHING PROVISION.
11. CABLE DESIGNATION DETAIL :

    AND TWISTED PAIR INSTRUMENTATION CABLE. (CU– CONDUCTOR)
    TYPE– F : 0.5 SQ.MM, MULTIPAIR OVERALL SHIELDED INDIVIDUAL PAIR SHIELDED

    INSTRUMENTATION CABLE. (CU– CONDUCTOR)
    TYPE– G : 0.5 SQ.MM, MULTIPAIR OVERALL SHIELDED AND TWISTED PAIR

PREPARED	CHECKED	APPROVED	DATE
LALIT	R. PRABHA	C.SARAVANAN	10.04.10