Bharat Heavy Electricals Limited
Piping Centre Chennai-17

Specification Number	Rev.no.	Sheet Number
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TECHNICAL SPECIFICATION FOR CONTROL VALVES

NTPC-BARH STPP (3X660 MW)

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Rev	Date	Alteration	Prepared	Approved(C&I)	Approved (Mech.)
00	02.06.2015	Fresh Issue	SD/-	SD/-	SD/-
			S.KAVITA	R PRABHA	SARAVANAN C

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

FEED WATER CONTROL VALVES	Tag no: LAB71 AA052, LAB70 AA051, LAB72 AA053, LAB81 AA052, LAB80 AA051, LAB82 AA053

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 shall be mounted integrally, tubed and supplied.

SECTION - III

EQUIPMENT SPECIFICATION

1. Feedwater Control Valves 4-00-306-40736/00

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.

10.0 Control valve Accessory Devices:

10.1 All control valve accessories such as 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.

TECHNICAL SPECIFICATION FOR CONTROL VALVES

TABLE V-A

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

Sl. no	Description of spare	Reference Drawing.	Item no.	Qty. reqd for commissioning Spare	Qty. reqd for Recommended Spare	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

- Vendor to work out quantity of spare as per logic specified by customer in the below table.
- Vendor to indicate the make/model of each of the items listed below.
- Duplicate items not to be quoted.

Control Valves, Actuators & Accessories(for all pneumatically operated valves)			Tag nos: LAB71AA052, LAB70 AA051, LAB81 AA052, LAB80 AA051 (Totally 12 nos for 3 units)	Tag Nos: LAB72 AA053, LAB82 AA053 (Totally 6 nos for 3 units)
1	Pneumatic and electro-hydraulic actuator assembly	10% or 1 No. of each type,model and rating, whichever is more	1 NO	1 NO
2	Position feed back transmitter	20% or 2 Nos. of each type, whichever is more.	2 NO	2 NO
3	Valve trim (including cage, plug, stem, seat rings, guide bushings etc.)	10% or One Set for each type whichever is more.	1 SET	1 SET
4	Diaphragms, O' rings, seals etc.	200% of all types, make etc.	24 NOS	12 NOS
5	Pneumatic air-filter/Regulator of each type, make, rating etc.	10% or 2 Nos. whichever is more	2 NOS	2 NOS
6	Pressure Gauges of all types, make, rating etc.	10% or 2 Nos. whichever is more	2 NOS	2 NOS
7	Solenoid valves	10% or 2 Nos. whichever is more	2 NOS	2 NOS
8	Air lock relays	10% or 2 Nos. whichever is more	2 NOS	2 NOS
9	Pneumatic relays	10% or 2 Nos. whichever is more	2 NOS	2 NOS
10	Positioner unit	20% or 1 Nos. of each type, whichever is more.	2 NOS	1 NO

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 analysis 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

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 m) Weight of all parts n) Erection, commissioning and mandatory spares identification along with their quantity. o) Weight of valve & actuator separately- total weight and flooded weight p) Class rating as per ASME B16.34 q) Make & Country of Manufacture r) Actuator Make & Type s) 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.

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)

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 manual containing minimum of the following detail.		LATER	5	5	15

	1) General arrgt. & cross sectional arrgt. drawings 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	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-BARH STPP,STAGE-I(3X660MW)

CUST.No: 7285,7286&7287

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION

1. Valve tag No. : Refer ANNEXURE-I
2. Service : Feed water control valves
3. Line No./Vessel No. :
4. Qty. required per unit : Refer ANNEXURE-I
5. Manufacturer : *
6. Model No. : *
7. Rating : Refer ANNEXURE-I
8. Total Qty Required : Refer ANNEXURE-I

BODY:

9. Type : Thru ☑ 3 Way ☐ Z type ☐ Angle ☐ ☐
10. Form : Globe ☑ Ball ☐ Butterfly ☐ ☐
11. Size : *
12. Port Size : *
13. Connecting pipe size : Inlet : Refer ANNEXURE-I Outlet : Refer ANNEXURE-I
14. Body rating : Refer ANNEXURE-I
16. Bonnet type : Standard ☐ Finned ☑ Extended ☑ Pr. seal ☐ ☐
17. Material : Body : Refer ANNEXURE-I Packing : GRAFOIL Bolting : *
18. Flow direction : HORIZONTAL
19. Suitable matching piece of P11/F11 material 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: ~~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 :

Refer ANNEXURE-I

29. --

ACTUATOR:

30. Type : Electric Hydraulic ☐ Pneumatic ☑
31. Size : * ☐ DA/RA(Air To Close) ☑
32. Supply : 5-6 Kg/cm^2 Shut off Pressure : 6 Kg/cm^2
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	APPROVED	APPD/C&I
00	29.05.15	FRESH ISSUE	E.KRITHIGA	C.SARAVANAN	R.PRABA

DRG. NO: 4-00-306-40736 REV 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 : IP55$

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 : Refer ANNEXURE–I
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 : Refer ANNEXURE–I
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 ANNEXURE–I				

REFER STANDARD TABLE

<85	dba	(for all conditions)		

29.05.15	E.KRITHIGA	C.SARAVANAN	R.PRABA	DRG. NO: 4–00–306–40736	REV 00
DATE	PREPARED	APPD	APPD/C&I		

DESIGN DATA:

70. Design Pressure Kg/cm^2(g) : Refer ANNEXURE–I
71. Design Temperature °C : Refer ANNEXURE–I
72. Rated/Design/Selected Cv of valve : *
73. Velocity restriction : *
74. Operating lift restriction : 10 to 80 %$.
75. lift at various operating Conditions : *
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 : 1 CD + 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; 3. $ AS PER TENDER SPECIFICATION
4. # AFTER INSPECTION, SMART POSITIONER TO BE PACKED SEPARATELY ALONG WITH THE CONTROL VALVE AND MOUNTING ACCESSORIES. THE SAME WILL BE OPENED AND INSTALLED ONLY DURING COMMISSIONING.

29.05.15	E.KRITHIGA	C.SARAVANAN	R.PRABA	DRG. NO: 4–00–306–40736	REV 00
DATE	PREPARED	APPD	APPD/C&I		

ANNEXURE-I

NTPC-BARH STPP,STAGE-I(3X660MW); CUST NOS: 7285,7286&7287

S.No	Tag no	Qty/unit	Total qty	Class rating	Connecting Pipe size/ Material	Material					Leakage class	Medium	Design parameters		Max Op.values				Min. Op.values				Normal Op.values			
						Body	Disk	Stem	Seat	Sealing			Pressure	Temp.	Inlet Pressure	Outlet Pressure	Temp.	Flow	Inlet Pressure	Outlet Pressure	Temp.	Flow	Inlet Pressure	Outlet Pressure	Temp.	Flow
													kg/sqcm(g)	deg C	kg/sqcm(g)	kg/sqcm(g)	deg C	t/hr	kg/sqcm(g)	kg/sqcm(g)	deg C	t/hr	kg/sqcm(g)	kg/sqcm(g)	deg C	t/hr
1	LAB71 AA052	1	3	2500 Special class	ID350x71.61 (SA106Gr.C)	WC9	400/70 (or 420)	400/70 (or 630)	400/70 (or 420)	Metal	IV	Feed water	394	300	310	305	290	1112.5	120	115	172	350	310	305	290	1080
2	LAB70 AA051	1	3	2500 Special class	ID350x71.61 (SA106Gr.C)	WC9	400/70 (or 420)	400/70 (or 630)	400/70 (or 420)	Metal	IV	Feed water	394	300	310	305	290	1112.5	120	115	172	350	310	305	290	1080
3	LAB81 AA052	1	3	2500 Special class	ID350x71.61 (SA106Gr.C)	WC9	400/70 (or 420)	400/70 (or 630)	400/70 (or 420)	Metal	IV	Feed water	394	300	310	305	290	1112.5	120	115	172	350	310	305	290	1080
4	LAB80 AA051	1	3	2500 Special class	ID350x71.61 (SA106Gr.C)	WC9	400/70 (or 420)	400/70 (or 630)	400/70 (or 420)	Metal	IV	Feed water	394	300	310	305	290	1112.5	120	115	172	350	310	305	290	1080
5	LAB72 AA053	1	3	2500 Special class	ID200x41.87 (SA106Gr.C)	WC9	400/70 (or 420)	400/70 (or 630)	400/70 (or 420)	Metal	IV	Feed water	334.5	300	-Refer table as given below-											
6	LAB82 AA053	1	3	2500 Special class	ID200x41.87 (SA106Gr.C)	WC9	400/70 (or 420)	400/70 (or 630)	400/70 (or 420)	Metal	IV	Feed water	334.5	300	-Refer table as given below-											

Process flow parameters for low load feed control valves (LBA72/82 AA053)

Operating condition	Flow	Inlet pressure	Outlet pressure	Temp
	t/hr	kg/sqcm(a)	kg/sqcm(a)	deg C
Initial filling	55	100	10	110
8% TMCR	72.5	100	35	110
14% TMCR	120	100	52	110
23% TMCR	208.5	100	82	140
36% TMCR	323.5	119	114	220
Maximum	400	180	175	230