					· · · · · · · · · · · · · · · · · · ·
Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	HIGH CAPACITY PRESSURE REDUCING VALVE AS-10; REFER TECH SPEC NO: PC:TSP:BONGAI:001,002&003 & DATA SHEET	NO	1.000	1.00	30.06.10
	NO 4-00-306-38581 L699018090101001				
	Draw.No:				in called the property of
	Var.No:		*	,	
20	LOW CAPACITY PRESSURE REDUCING VALVE AS-19; REFER TECH SPEC NO: PC:TSP:BONGAI:001,002&003 & DATA SHEET	NO	1.000	1.00	30.06.10
	NO 4-00-306-38582 L699018090101002		: :		
	2099010090101002				
	Draw.No:				
	Var.No:		Sp. 187		
30	COMMON SPRAY BLOCK VALVE CD-15; REFER TECH SPEC NO: PC:TSP:BONGAI:001,002&003 & DATA SHEET NO 4-00-306-38762	NO	1.000	1.00	30.06.10
	L699018090101003			•	
1	Draw.No:				
ı	Var.No:				
40	HIGH CAPACITY SPRAY CONTROL VALVE CD-02&CD-04 REFER TECH SPEC NO: PC:TSP:BONGAI:001,002&003 & DATA SHEET NO 4-00-306-38583 L699018090101004	NO	2.000	2.00	30.06.10
	2077010070101001				-
	Draw.No: Var.No:				20.05.10
50	LOW CAPACITY SPRAY CONTROL VALVE CD-08&CD-11 REFER TECH SPEC NO: PC:TSP:BONGAI:001,002&003 & DATA SHEET NO 4-00-306-38584 L699018090101005	NO	2.000	2.00	30.06.10
	Draw.No:				
	Var.No:			1.00	20.06.10
60	HIGH CAPACITY DESUPER HEATER DESH-01; REFER TECH SPEC NO:	NO	1.000	1.00	30.06.10

					and the second s	والمعمود والمستحد والمستخدر والمستحد وا
r indián	igaga saa aydiiriind	PC:TSP:BONGAI:001,002&003 & DATA SHEET	nga gilah dan ilah dalah penglas jan disent	ana shina sha mina maka da kana ata a mina kana gamina a sha a mafani ma kana ya gamina shi ya ka kana mi		
		NO 4-00-306-38585				
		L699018090101006				
		Draw.No:				
		Var.No:				00.00.10
_	70		NO	1.000	1,00	30.06.10
7	70	DEEED TECH SPEC NO:	. । च ⁴			
		PC:TSP:BONGAI:001,002&003 & DATA SHEET				
		NO 4-00-306-38586				
		L699018090101007				
٠		Dunie Mar				
1		Draw.No:				
		Var.No: HIGH CAPACITY PRESSURE REDUCING VALVE	NO	1.000	1.00	30.06.10
	80	AS 10 REFER TECH SPEC NO:	NO	21000		
		PC:TSP:BONGAI:001,002&003 & DATA SHEET				
		NO 4-00-306-38581				
		L699118090101001		,		
		Draw.No:				
		Var.No:	NIC	1.000	1.00	30.06.10
	90	LOW CAPACITY PRESSURE REDUCING VALVE	NO	1.000		
-		AS-19; REFER TECH SPEC NO: PC:TSP:BONGAI:001,002&003 & DATA SHEET				
		NO 4-00-306-38582		the Arman		* **
		L699118090101002				
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	San are	Draw.No:				2.1
		Var.No:	NIO.	1.000	1.00	. 30.06.10
-	100	TICL OPEC NO. PC:TSP:BONGAI:001	МО	1.000	as a of 20	
-		,002&003 & DATA SHEET NO 4-00-306-38762				
1		L699118090101003				
		Draw.No:				
		Var.No:			2.00	30.06.10
	110	HIGH CAPACITY SPRAY CONTROL VALVE	NO	2.000	2.00	20,00,10
	110	CD-028/CD-04 REFER TECH SPEC NO:				
		PC:TSP:BONGAI:001,002&003 & DATA SHEET NO 4-00-306-38583				
		L699118090101004				
	1	70>>100>010000				
		Draw.No:	÷			
	***************************************	Var.No:			0.00	30.06.10
	120	LOW CAPACITY SPRAY CONTROL VALVE	NO	2.000	2.00	30.00.10
	120	CD 008 CD-11: REFER TECH SPEC NO:				
		PC:TSP:BONGAI:001,002&003 & DATA SHEET				
		NO 4-00-306-38584 L699118090101005				
		T022110020101002				
		Draw.No:	•			
	1	DIWW.INU.			*	

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	Var.No:		* · ·	Jan	20.06.10
130	HIGH CAPACITY DESUPER HEATER DESH-01; REFER TECH SPEC NO:	NO	1.000	1.00	30.06.10
	PC:TSP:BONGAI:001,002&003 & DATA SHEET			. *	
	NO 4-00-306-38585 L699118090101006		•		
	F022110020101000				
	Draw.No:				
	Var.No:			1.00	20.06.10
140	LOW CAPACITY DESUPER HEATER DESH-02; REFER TECH SPEC NO:	NO	1.000	1.00	30.06.10
	PC:TSP:BONGAI:001,002&003 & DATA SHEET				
f	NO 4-00-306-38586 L699118090101007				
	1.033110030101001		1		
	Draw.No:				
	Var.No:			1.00	20.06.10
150	HIGH CAPACITY PRESSURE REDUCING VALVE AS-10; REFER TECH SPEC NO:	ЙO	1.000	1.00	30.06.10
	PC:TSP:BONGAI:001,002&003 & DATA SHEET				
	NO 4-00-306-38581 L699218090101001				
April 1	L699218090101001				
1	Draw.No:				
	Var.No:	3.7.00	1.000	1.00	30.06.10
160	LOW-CAPACITY PRESSURE REDUCING VALVE AS-19; REFER TECH SPEC NO:	- NO	1.000	1.00	20.00.10
	PC:TSP:BONGAI:001,002&003 & DATA SHEET				
	NO 4-00-306-38582 L699218090101002				
and the state of t					
Austonomo	Draw.No:				
1	Var.No: COMMON SPRAY BLOCK VALVE CD-15; REFER	MO	1.000	1.00	30.06.10
170	TECH SPEC NO: PC:TSP:BONGAI:001		1.000	1,00	00.00ex
	,002&003 & DATA SHEET NO 4-00-306-38762				
	L699218090101003				
	Draw.No:				
	Var.No:			6.00	20.06.10
180	HIGH CAPACITY SPRAY CONTROL VALVE CD-02&CD-04 REFER TECH SPEC NO:	NO	2.000	2.00	30.06.10
	PC:TSP:BONGAI:001,002&003 & DATA SHEET				
	NO 4-00-306-38583 L699218090101004				
	£079210070101004		×		
	Draw.No:				
	Var.No:		2.000	0.00	30.06.10
190	LOW CAPACITY SPRAY CONTROL VALVE CD-08&CD-11 REFER TECH SPEC NO:	NO	2.000	2.00	50.00.10
	PC:TSP:BONGAI:001,002&003 & DATA SHEET				
-	NO 4-00-306-38584			•	•

			A SECURE OF THE PROPERTY OF TH	the regions for a measurable desirable to be specially desirable with the property and appropriate property and	
	L699218090101005				
200	Draw.No: Var.No: HIGH CAPACITY DESUPER HEATER DESH-01; REFER TECH SPEC NO: PC:TSP:BONGAI:001,002&003 & DATA SHEET NO 4-00-306-38585 L699218090101006	NO	1.000	1.00	30.06.10
	3.000 1010 1010		•		
	Draw.No: Var.No:			1.00	20.06.10
210	LOW CAPACITY DESUPER HEATER DESH-02; REFER TECH SPEC NO: PC:TSP:BONGAI:001,002&003 & DATA SHEET NO 4-00-306-38586 L699218090101007	NO	1.000	1.00	30.06.10
	Draw.No: Var.No:				



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TECHNICAL SPECIFICATION FOR CONTROL VALVES

NTPC LIMITED BONGAIGAON THERMAL POWER PROJECT (3X250 MW)

C	ONTEN	<u>TS</u>	
1	.0		IMPORTANT NOTE TO THE BIDDER
2	.0	SECTION I	INTENT OF SPECIFICATION
3	0.0	SECTION II	SCOPE OF WORK AND SUPPLY
4	ł.0	SECTION III	EQUIPMENT SPECIFICATION
C	5.0	SECTION IV	GENERAL TECHNICAL REQUIREMENTS
6	5.0	SECTION V	SPARES & SPECIAL TOOLS
7	7.0	TABLE V-A	LIST OF SPARES
8	3.0	TABLE V-B	LIST OF SPECIAL TOOLS
(9.0	TABLE V-C	LIST OF MANDATORY SPARES
	10.0	SECTION VI	QUALITY ASSURANCE, INSPECTION & TESTING
	11.0	SECTION VII	DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER
	12.0	SECTION VIII	DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT
	13.0	ANNEXURE-A	DATA SHEETS
	14.0	ANNEXURE-B & C	PNEUMATIC HOOK UP & TERMINAL BOX WIRING DIAGRAM
	15.0	ANNEXURE-D	TECHNICAL REQUIREMENT-NTPC

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



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

Important note to the Bidder

Bidder is to take Photostat copy of Table V-A & Table V-B, control valve data sheets, Section VII and section VIII of this specification, fill it by neatly typing and submit the same along with the offer. Non-compliance of the above shall lead to rejection of the offer. Information called for in the above tables, sections of the Technical specification furnished in any other format shall be considered only for information.



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

SECTION - I

INTENT OF SPECIFICATION

- This specification is intended to cover the design, engineering, manufacture, shop

 Fabrication, assembly, tests and inspection at manufacturer's works, packing and despatch

 of control valves for the mentioned project.
- 2.0 The equipment to be supplied as per this Technical specification shall be suitable for the site conditions specified in Equipment specification (Section III)
- 3.0 It is not the intent to completely specify herein all aspects of design and construction of equipment. Nevertheless the equipment shall conform to all aspects of high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation in a manner acceptable to the purchaser who will interpret the meaning of the specification, drawings and shall have right to accept or reject any work or material which in his assessment is not complete to meet the requirements of this specification and/or applicable national and/or international standards mentioned elsewhere in the specification.
- 4.0 If any provision of this specification departs from the bidder's usual construction sufficiently to materially increase cost of equipment without (in bidders opinion) providing a corresponding increase in quality or if the bidder considers that his usual construction would provide better quality, the Bidder shall call this to the attention of the Purchaser by submitting an alternate bid. However in any case, a base bid shall be submitted based on the equipment and services as specified.



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

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 Pressure Reducing valve	TAG No. AS 10
2. Low capacity Pressure Reducing valve	TAG No. AS 19
3. Common spray block valve	TAG No. CD-15
4. High capacity spray CV	TAG No.CD-02,CD-04
5. High capacity Desuperheater	TAG No.DESH-01
6. Low capacity spray PCV	TAG No.CD-08,CD-11
7 Low Capacity Desuperheater	TAG No.DESH-02

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



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

SECTION - III

EQUIPMENT SPECIFICATION

1. High capacity PR valve TAG No. AS 10	4-00-306-38581/REV00 (4 SHEETS)
2. Low capacity PR valve TAG No. AS 19	4-00-306-38582/REV00 (4 SHEETS)
3. Spray Water Common block valve TAG No. CD-15	4-00-306-38762/REV00 (4 SHEETS)
4. High capacity spray CV TAG No.CD-02, CD-04	4-00-306-38583/REV00 (4 SHEETS)
5 Low capacity spray CV TAG No.CD-08,CD-11	4-00-306-38584/REV00 (4 SHEETS)
6. High Capacity desuperheater TAG No.DESH-01	4-00-306-38585/REV00 (2 SHEETS)
7 Lo Desuperheater TAG No.DESH-02	4-00-306-38586/REV00 (2 SHEET)
9. Schematic Arrangement of Aux. PRDS station	4-00-301-38579/REV00 (1 SHEET)



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

Section IV

General technical requirements

- 1.0 The Control valves and accessories furnished by the bidder shall be designed, constructed and tested in accordance with the latest applicable requirements of code for power piping ASME B31.1, the ASME Boiler & Pressure vessel code, Indian Boiler Regulation (IBR), ISA, and other standards specified elsewhere as well as in accordance with all applicable requirements of the "Federal Occupational Safety and Health Standards, USA" or acceptable equal standards.
- 2.0 The design of all valve bodies shall meet the specification requirements and shall conform to the requirements of ASME for dimensions, material thickness and material specification for their respective pressure classes.
- 3.0 The valve sizing shall be suitable for obtaining maximum flow conditions with valve openings at approximately 80% of total valve stem travel and minimum flow conditions with valve stem travel not less than 10% of total valve stem travel. All the valves shall be capable of handling at least 120% of the required maximum flow. Further the valve stem travel range from minimum flow condition to maximum flow condition shall not be less than 50% of total valve stem travel. The sizing shall be in accordance with the latest edition of ISA handbook on control valves. While deciding the size of valves, Bidder shall ensure that velocity at valve outlet does not exceed 8 m/sec for liquid service, 150 m/sec for steam services and 50% of sonic velocity for flashing services. Bidder shall furnish the sizing calculations clearly indicating the outlet velocity achieved with the valve size selected by him as well as noise calculations, which will be subject to Owner's approval during detailed engineering.



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

- 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:

- 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.



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

- 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.
- 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:

- 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/cm² 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.



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

110.0 <u>Control valve Accessory Devices:</u>

10.0 <u>Control valve Accessory Devices:</u>

All control valve accessories such as I/P converters, air locks, hand wheels / hand-jacks,
Torque switches, smart positioners, solenoid valves, diffusers, external volume chambers,
Position transmitters (capacitance type only), tubing and air sets and junction boxes etc.
Shall be provided as per requirements.

10.2 I/P Converter: (IF APPLICABLE)

Type

: Fail-Freeze type (Electronic)

Input

: 4 - 20 mA

Air supply

: $1.5 \text{ Kg} / \text{cm}^2 \text{ (g)}$

Linearity

: 0.5 % of span

Hysterisis

: 0.1 % of span

Amb. Temp. Effect

< 0.02 % of span

Protection

: IP 55

Allowed Drift

: $\pm 2\%$ of set point / hr

11.0 <u>NAME PLATE:</u>

- 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



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

Requirements.

Section V

Spares & Special Tools

1.0 <u>Commissioning spares</u>

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 <u>Recommended spares</u>

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 <u>Mandatory spares</u>

Mandatory spares are those spares, which are considered essential by the purchaser for Normal operation of the plant. If such spares are indicated, bidder shall indicate the Price for each and every item in the schedule of mandatory spares whether or not the Bidder considers it necessary for the purchaser to have it. If the bidder fails to comply With the above or fails to quote the price of any mandatory spares the cost of such Spares shall be deemed to be included in the contract price.



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

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



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

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



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

TABLE V-A

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

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Signature of the bidder.



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

TABLE V-B

LIST OF special tools (To be filled in by the bidder)

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	emmore oben Samon		
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Signature of the bidder.



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

TABLE-V-C MANDATORY SPARES

S No.	De	escription	Qt	Υ	Unit
1.	High Capac	city PRDS system			
1.0	Desuperhe	ater Liner ssure reducing	1		Set
	cum desup i) S ii) [perheating valves Stem Disc Body seat rings	1 1 2 for each type, Size & rating of valves		Number Number Number
	iv) (Gland packing	2 for each type, Size & rating of valves		Number
	1	Pressure seal ring Gasket	3 2	1	Number Number
1.2	line contro Valve trim plug, stem	city spray water of valves. including cage, n, seat rings, hings, stem	1 For each Type, size and rating Of valves	g place control process manages — declinates de control process de con	Number
2.		city PRDS system			
	ii. Ste iii. Dis iv. Bo		1 2 for each type, size and rating 2 for each Type, size and		Number Number Number Number
		essure seal ring asket	rating of valve 3		Number Number



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

2.2	line contro Valve trim plug, stem	ity spray water ol valves. including cage, n, seat rings, hings, stem	1 for each Type, size and rating of valves			Number
3.0		Actuators &	<u>Assemblies</u>			
	i)	Actuator assembly				o. Each type, rating which ever
	ii)		ngs, seals etc. of all	type,	200% for e	ach model
	iii)	make etc. Pneumatic air filte make rating etc.	er/regulator of each	type,	5% or one more	no. Whichever is
	iv)	Pressure gauges	of all types, make ra	iting etc.	5% or one Whichever	no. Of each type is more
	v)	Solenoid valves			10% or tw Whichever	o no. Of each type is more
	vi)	Positioner unit			20% or on Whicheve	ne no. Of each type r is more
	vii)	Solenoid valves			20% or tw Whicheve	vo no. Of each type r is more



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

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



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TECHNICAL SPECIFICATION FOR AUX, PRDS CONTROL VALVES

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 subcontractors 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.
- The contractor shall adopt good quality control procedures and provide inspection in his works and that of his sub-contractors to ensure the mechanical accuracy of components, compliance with drawings, identify and acceptability of all material, part and equipment. He shall conduct all tests required to ensure that the equipment furnished conforms to the requirements of the applicable codes. All tests and test procedures proposed by the manufacturer/fabricator shall be submitted to the purchaser for his prior approval. The purchaser shall be notified well in advance of the fabrication and major tests of the appurtenances and equipment, for the purpose of making general inspections and progress reports.
- 2.3 The Purchaser's representative shall have full access to the shops where the equipment to be supplied is being tested and all test records including records on heat treatment, radiography, ultrasonic test, magnetic particle test, material analyses etc. shall be made available to him. When the contractor offers finished



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

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 <u>Material test and analysis:</u>

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:	•
Sl.no	Description	To be filled by the bidder. Bidder's
og valentamenteles i		drawing or document reference (if not
1.0	General arrangement drawing of the valves	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	n
	operators and special accessories indicating	g
	minimum the following:	
1		



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

- 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



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

	I) 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.



	Specification Number	Rev.no.	Sheet Number
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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)



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

SECTION VIII

Documents to be furnished after award of the contract

All documents shall be in ENGLISH language only

Note:

Only units followed in this specification are to be used.

All documents shall contain the project name

Applicable valve tag nos. GOQS

Sl.no	Sl.no Description	Ref. Drawing	No of days reqd. To submit for approval after	No. of copies to be sent for approval.	No of days to furnish final drg after final	No of days reqd. No. of copies to No of days to No of copies to To submit for be sent for furnish final drg be furnished approval.
			resubmit for approval after BHEL comments.			, , , ,
o,	General arrangement drawing as per point 1, section VII.	à	15	'n	Ŋ	ro Lo
2.0	Cross sectional drawing as per point 2, section VII		2	'n	IJ	15
3.0	Applicable catalogue of valve.		15	ហ	го	4



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

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Erection, commissioning, operation and maintenance Manuel containing minimum of the following detail.	1) General arrgt. & cross sectional arrgt. Drgs as per point 1&2 of section VII respectively	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.
0.4							OTHER COMPLETE LEGGE OF THE PROPERTY.	



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

5.0	Test certificates.	Not Applicable.	erona Erona Erona	Ç.	q
	Raw material test certificates (chemical & mechanical)				
	2) Hydro test certificates.				
	3) Seat test certificates				
	4) Back seat test certificates				о в нем веренения от тере, установания постанования постанования постанования постанования постанования в пост
	5) NDT & other test certificates as per ASME B 31.1				
6.0	IBR and other mandatory	Not Applicable	2	75	<u>ب</u>
7.0	Reproducible of drawings in sl no: 1.0 & 2.0	Not Applicable	2	09	ក

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



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TECHNICAL SPECIFICATION FOR AUX.PRDS CONTROL VALVES

SECTION - III-- EQUIPEMENT SPECIFICATION

	BONGAIGAON
1. High capacity Pressure control valve TAG No. AS 10	4-00-306-38581/REV00 (4 SHEETS)
2. Low capacity Pressure control valve TAG No. AS 19	4-00-306-38582/REV00 (4 SHEETS)
3. Common spray block valve TAG No. CD-15	4-00-306-38762/REV00 (4 SHEETS)
4. High capacity spray CV TAG No. CD-02,CD-04	4-00-306-38583/REV00 (4 SHEETS)
5 Low capacity spray CV TAG No. CD-08,CD-11	4-00-306-38584/REV00 (4 SHEETS)
6.High capacity Desuperheater ,TAG NO:DESH-01	4-00-306-38585/REV00 (2 SHEETS)
7.Low Capacity Desuperheater TAG No.DESH-02	4-00-306-38586/REV00 (2 SHEET)
8.Schematic Arrangement of Aux. PRDS station	4-00-301-38579/REV00 (1 SHEET)

PROJECT:

CONTROL VALVE SPECIFICATION SHEET

(IN ACCORDANCE WITH LS.A. FORM \$20.51)

NTPC LTD BONGAIGAON TPP (3x250 MW)	CUST.No: 6990,6991&6992
ENERAL:THIS IS TO BE READ ALONG WITH TEC 1. Valve tag No. AS-10	HNICAL SPECIFICATION PC: TSP: BONGAI:001002 5. Manufacturer : * & &003
2. Service : High capacity	6. Model No. : *
PR valve	7. Rating : ASME CL. 2500 Spl.
3. Line No. / Vessel No. :4. Qty. required ; ONE	8. Total Qty Required : 1 Nos
BODY:	
9. Type: Thru 3 Way Z type	16. Bonnet type : Standard Finned Finned Extended Pr. seal
10. Form : Globe 🗹 Ball	
Butterfly : * 11. Size : *	17. Material : Body : ASTM A 18 2 G r. F22 Packing: GRAFOIL
(bidder to match size of control valve with	Bolting: *
given 'd1' values) 13. Connecting Pipe size /EP Steam Inlet : 0D 219.1 x 36(P22) Steam Outlet : 1D 260 x 51(P22)	 18. Flow direction : HORIZONTAL 19. Suitable matching pieces to match with pipe size specified shall be offered.
14. Body rating : ASME CL. 2500 Spl.	
Flanged	BSPT BS D
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 : 410/CoCr—A OR EQUIVALENT : 28. stem guide material : 29. Cage Material : F22 Ion Nitrided (or) Better
ACTUATOR:	34. Diaphragm/Cylinder pressure at
30. Type: Electric Pneumatic	Valve full open : * Valve full close :
Hydraulic DA/RA(Air To Close)	35. Force required for process & * Force available at actuator.
31. Size : *	36. Actuator sizing △P : *
32. Supply: 45 PSIG 33. Failsafe position: Stayput of valve. Full Crose Full Open	37. If actuator electric fill in data sheet as per annexure : NAPL furnished and shall comply with annexure—I specification.
00 12/10/09 FRESH ISSUE PARAMESH R.P.RABHA C.V.NAIHAI REV DATE ALTERATION PREPARED APPROVED APPROVE	4-00-306, 38581

SHEET 1 OF 4

POSITIONER: SMART SEMEN MAKE MODEL NO: 60R5211 - 0EN00-0AA0+6DR4004-8J []	O. If Poeumatic : Type . *
38. Type: Preumatic	Model: * Split range : Yes No
DA/RA Electro Pneumatic	Controller Input & Controller In
39. If Electronic : Type :	Output Signal Value (
Model : Solid plate deversing	Input/Output Pr. guage:
contactors	Required : Yes No
Main contactor: Solid state thyristor:	By pass provision : Yes No Action : Direct Reverse Both
Relay Switching :	Action : Direct Reverse Both Cam : =% Linear Both
Also refer annexure II	July 1 1/4 Landar Landa
position indicator read. for Valve & VCB	
ACCESSORIES:	49. Position transmitter : Yes No P
41. Handwheel ; Yes Side Top	Flectronic F
42. Air filter : Yes No	Type : Pnuematic : Non contact V
Filter Size : 5 Micron 25 Micron	Rating : 2 wire 24V DC:
43. Limit Switches : Yes No No	Output : 4-20 ma : 3-15 paig
Qty. : 1 at full open &	50. Torque Switches : Yes No No
; 1 ot full close	Qty. :
Rating : 240v. 5Amp. ac	Rating : 51. Air lock :Yes No
No of contacts per switch : 2No + 2NC	
44. Solenoid valve to effect	Function : TO EFFECT STAYPUT
Stayput : Yes No	Type ≭ :3 Way single acting 📙
Type : 3 Way universal: Yes Mo	:3 Way double acting
Rating: 24V DC 2 wire Class H coil: Yes No	52. Ambience : Dusty corrosive
45. Vol. booster : Yes No	Toxic hozordous :
46. Travel time : < 10 sec	53.1. Local position Indicator: Required. 53.2. I/P converter with : Not Required
47. Installation : Indoor Outdoor	A/F regulator (FAIL FREEZE TYPE) 53.3 Integral JB : 36 Way JB required
48. All accessories enclosure : *	2 No s of 9 pin plug & socket connector.
MISCELLANEOUS:	1 No of 5 pin plug & socket connector. 57. Valve sizing as per
54. Seat leakage: ASME FCI/RP 70.2 CLASS IV	ISA 75.01 :Yes No
I.S.A:	58. Noise Level :Less than 85 DBA at 1m
55. Approx. weight (total) : *	from Valve & Piping System 59. Intertubing Diagram : As per Enclosed.
56. Space requirements for : *	60. Performance Data
online servicing	Linearity: ± 1 % Hyterisis: ± 0.5 Sensitivity: ± 0.5 % Accuracy (overall): ± 2 %
VALVE SIZING DATA:	
61. Medium : SH Steam Sat. Steam Water	CONDITION 1 2 3 4 5
62. Flow rate in T/Hr	REFER DRAWING No.
63. Operating inlet pressure in Kg/cm² (a) 64. Operating inlet temperature in C	4-00-306-38581 sht 4 of 4
65. Outlet pressure in Kg/cm² (a)	FOR VALVE SIZING DATA
66. Viscosity	REFER STANDARD TABLE X X X X X X
67. Operating (required) Cv 68. Operating noise level at 1.5 metre	x x x x x x x x x x x x x x x x x x x
69. Outlet velocity	* * * * *
12/10/09 PARAMESH R.PRABHA C V.NATHAT	DRG. NO: RE 4-00-306-38581 00
DATE PREPARED APPROVED APPROVED	SHEET 2 OF

	IGN DATA:						
70.	Design Pressure Kg/cm ² (g)	167.1	5		75.	lift at various operating	
71.	Design Temperature *C	: 5	ΛS		On the State of th	Conditions 1 TO 6 : *	
	Rated/Design/Selected Cv of		4J		76.	Down stream limitations : *	
	Velocity restriction :*	70170	٠		1	Up stream limitations : *	
	Operating lift restriction : 15	to 80) %		/8,	Increase in signal Air : To open the	Valve
II overlyne menter og v	TING/INSPECTION:						
			<u></u>	[····-]			
79. 80.	Hydraulic test report				84.	Accessories functional : Yes No	
OU.	Radiography : Critical Parts		Les Tota			Test :	
81	Not required IBR test report : Reqd.	:			1	Seat leakage test : Yes No	
82.	Type test : Capacity Evoluation				86.	Material test report : Yes No	
	ISA S39.2/5 39.4		guirod		87.	Customer Inspection :	
83.	Valve functional test		·		***************************************	In process : Yes No [Final : Yes No [\exists
					88.	Third Party inspection : Yes No [
					a. mahayayayaya		
DOC	UMENTATION: (Required)			2 20 20 20 20 20 20 20 20 20 20 20 20 20			OCT VSOMENME
89.	With bid. (3 sets)				91.	With equipment :	
			W No			Dimensional drawing: 15 Sets	
	Dimensional drawing	: Yes	No No			0 & M ** :do	
		Yes	L No			Data Sheets :do	
	Recommendation / Limitation	: Yes	W No			Test certificate : 1RTF + 3 Sets	
	Confirmatory report		W No		92.	Valve sizing, actuator sizing, noise level calculations required	
	Contrary report	: Yes	No No		Name and Associated Street, St	with bid(with formulae) : Yes No	
	Deviation report	: Yes	W No		93.		
90.	Quality plan (enclosed)	: Yes	No No				
	RES:			minmum umunanasan saar-			
94. 95.	Commissioning spares	:	*		96.	2/3 Years maintenance spares : *	
95.	Mandatory spares	: As pe	er specific	ation			
					West recommendation.		herometer de de la composition de la c
	ERS: Bidders experience list	•		R ₀	quirad	W	
	Bidders experience list Operational feed back of such			Re	quired	Not required	
97. 98.	Bidders experience list Operational feed back of such valves supplied elsewhere			Re	quired	Not required Not required	
97.98.99.	Bidders experience list Operational feed back of such			Re-	quired quired	Not required Not required	
97. 98. 99. 100. 101.	Bidders experience list Operational feed back of such valves supplied elsewhere Equipment guarantee System guarantee Service contract for 5 Years	i : :	To quote s	Re Re Re sepera	quired quired quired ately	Not required	
97.98.99.100.101.102.	Bidders experience list Operational feed back of such valves supplied elsewhere Equipment guarantee System guarantee Service contract for 5 Years Commissioning of the valves	i : :	To quote s	Re Re Re sepera	quired quired quired	Not required Not required	
97. 98. 99. 100. 101. 102. NOT	Bidders experience list Operational feed back of such valves supplied elsewhere Equipment guarantee System guarantee Service contract for 5 Years Commissioning of the valves	i : :		Re Re Re sepero Re	quired quired quired <u>ately</u> quired	Not required Not required Not required Not required	

HEL			4-00-306-38581					
	PROJECT TITLE: NTPC BONGAIGAON (3 X 250 MW)							
		enderstaar reduceranjoper, op Courbbook de potten	SHEET NO. 4 OF 1					
Opposition (1.1.) (1.1.	SL.NO.	PARAMETERS	CONDITION-1 (15% LOAD), (COLD START) (Case-I)	CONDITION-2 (30% LOAD) (ROT/ COLD) (Cases -3 & 4)	CONDITION-3 (100 % + SECOND UNIT START-UP REQT. + INTERMITTENT REQT.) (Case-8)	CONDITION-4 15 % LOAD, (HOT START) (Case- 2)		
-	1.0	INLET OF AUX. PRDS (INLET OF PRV)	ener service de la companya del la companya de la c					
1	1.1	PRESSURE (kg/cm ² (a))	38	82/46	150.00	82.00		
1	1.2	TEMPERATURE (°C)	395	495/430	537.0	440.0		
1	1.3	FLOW (T/Hr)	63.77	70.4/82.2	107.20	67.17		
	2.0	OUTLET OF AUX. PRDS (AFTER DESUPERHEATING)						
	2.1	PRESSURE (kg/cm² (a))	16.0	16.0	16.0	16.0		
	Witness Commission Commission				And the second second			

1.	CONDITION	1 IS	THE	CAPABIL	ITY	CHECK	POINT
----	-----------	------	-----	---------	-----	-------	-------

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CONTROL VALVE SPECIFICATION SHEET

(IN ACCORDANCE WITH I.S.A. FORM \$20.51)

PROJECT: NTPC LTD

BONGAIGAON TPP (3x250 MW)	CUST.No:6990,6991&6992
ENERAL:THIS IS TO BE READ ALONG WITH TEC . Valve tag No. AS-19	CHNICAL SPECIFICATION PC: TSP: BONGAI:001002
	6. Model No. : *
. Service : Low capacity Pressure Control valve	7. Rating : ASME CL. 600
C. Bas Na Alasad No.	8. Total Qty
5. Line No./Vessel No. :	Required : 1 No
1. Qty. required : ONE	
Thru 3 Way Z type Angle Angle Butterfly Size * 12. Port Size (Bidder to match size of control valve with given 'd1' values) 13. Connecting pipe size Inlet : OD 114.3x6.02(SA 106 GrC) Outlet : OD 168.3 x 7.11(SA 106 GrC) 14. Body rating : ASME CL. 600	16. Bonnet type: Standard Finned Extended Pr. seal 17. Material: Body: ASTM A 216 Gr WCC 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 SW SW SPT BS DIN
Edge Preparation as per BPS.	
TRIM: 20. No. of ports : * 21. Type : Balanced Unbalanced Unbala	24. Stem material : 25. Plug material : 26. Seat material : 27. Disc material : 28. stem guide material : 29. ——
ACTUATOR: 30. Type: Electric Pneumatic	34. Diaphragm/Cylinder pressure at Valve full open : * Valve full close :
Hydraulic DA/RA(Air To Clos	e) 35. Force required for process & . * Force available at actuator.
31. Size : *	36. Actuator sizing ΔP : *
32. Supply: 45 PSIG 33. Failsafe position: Stayput of valve. Full Close Full Open	37. If actuator electric fill in data sheet as per annexure : NAPL furnished and shall comply with annexure—I specification.
00 12/10/09 FRESH ISSUE AND SOUR SYNAM	
12/10/09 FRESH 1330E PARAMESH R.PRABHA C.V.NAT	4-00-306-38582

SMART SIEMEN MAKE POSITIONER: MODEL NO:6DR5211-0EN00-0AA0+6DR4004-8J	40. If Pneumatic : Type : *
38. Type : Pneumatic Electronic	Model: * Split range : Yes No
DA/RA Electro Pneumatic	Controller Input & Coutput Signal Value : 4-20 mA
39. If Electronic : Type : (SMART)	Output Signal Value 3 4 20 1117 Air supply : 45 PSIG
Model : Solid plate deversing	Input/Output Pr. guage:
contactors	Required : Yes No No
Main contactor : Solid state thyristor:	By pass provision : Yes No
Relay Switching:	Action : Direct Reverse Both Cam : =% Linear Both
Also refer annexure	Cutt% [] Litted [] Bottle
position indicator reqd. for Valve & VCB	
ACCESSORIES:	49. Position transmitter : Yes No
41. Handwheel : Yes Side Top	
42. Air filter : Yes 🗹 No	Type : Pnuematic : Electronic Non contact type
Filter Size : 5 Micron 25 Micron	Rating: 2 wire 24V DC:
43. Limit Switches : Yes No	Output : 4—20 ma : 2—3—15 paig
Qty. : 1 at full open &	50. Torque Switches :Yes No No
: 1 at full close	Qty. :
Rating : 240v. 5Amp. ac	Roting :
No of contacts per switch : 2No + 2NC	51. Air lock : Yes No Function : TO EFFECT STAYPUT
44. Solenoid valve to effect	Function : TO EFFECT STAYPUT Type ≵ :3 Way single acting
Stayput : Yes No	:3 Way double acting
Type : 3 Way universal: Yes No	52. Ambience : Dusty corrosive
Rating: 24V DC 2 wire	Toxic hazardous :
Class H coil : Yes No 45. Vol. booster : Yes No	53.1 Local position Indicator: Required
45. Vol. booster : Yes No 46. Travel time : <10 SEC	33.2. 1/P converter with : Not kequired
47. Installation : Indoor Outdoor	A/F regulator (FAIL FREEZE TYPE) 53.3 Integral JB : 36 Way JB required
48. All accessories enclosure : *	2 No s of 9 pin plug & socket connector.
	1 No of 5 pin plug & socket connector.
MISCELLANEOUS: 54. Seat leakage: ASME FCI/RP 70.2 CLASS IV	57. Valve sizing as per ISA 75.01 : Yes No
1.S.A :	58. Noise Level :Less than 85 DBA at 1m
55. Approx. weight (total) : *	from Valve & Piping System. 59. Intertubing Diagram : As per Enclosed.
56. Space requirements for : *	60. Performance Data
online servicing	Linearity: ± 1 % Hyterisis: ± 0.5 % Sensitivity: ± 0.5 % Accuracy (overall): ± 2 %
VALVE SIZING DATA:	
61. Medium: SH Steam Sat. Steam Water	CONDITION
62. Flow rate in T/Hr	REFER DRAWING No.
63. Operating inlet pressure in Kg/cm² (a) 64. Operating inlet temperature in C	4-00-306-38582 OF SHT 4 OF 4
65. Outlet pressure in Kg/cm² (a)	FOR VALVE SIZING DATA
66. Viscosity :	REFER STANDARD TABLE * * * * * * *
67. Operating (required) Cv 68. Operating noise level at 1.5 metre	<pre></pre>
69. Outlet velocity	* * * * *
12/10/09 PARAMESH RPRABHA PC.V.NATHAN	
DATE PREPARED APPROVED APPROVED	SHEET 2 OF

	N DATA:	en in Market State Committee in the Committee of the Comm
1. D 2. F 3. V	Design Pressure Kg/cm²(g) : 48 Kg/Cm²(g) Design Temperature 'C : 365 'C' Rated/Design/Selected Cv of valve : * Velocity restriction : * Operating lift restriction : 15 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 Valv
ESTI	ING/INSPECTION:	
30. 31. 32.	Hydraulic test report : Yes No Radiography : Critical Parts : Total Not required : IBR test report : Reqd. : ISA S39.2/5 39.4 : Required Valve functional test : Yes No	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
89.	With bid. (3 sets) Catalogues : Yes No Dimensional drawing : Yes No Catalogues : Yes	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
	RES: Commissioning spares : *	96. 2/3 Years maintenance spares : *
95.	Mandatory spares : As per specification	n
97. 98. 99. 100 101. 102 NO 3	Operational feed back of such valves supplied elsewhere : REQUIPMENT GUARANTE : REQUIPME	Required Not required

HEL		AUXILIARY PRDS SIZI	NG CALCULATI	ON		· · · · · · · · · · · · · · · · · · ·	4-00-306-38582			
inoposites in instead		PROJECT TITLE: NTPC BONGAIGAON (3 X 250 MW)								
		SIZING DATA FOR LOW C	APACITY PRESSUR	E REDUCING VAI	VE		and the second			
	SL.NO.	PARAMETERS	CONDITION-1 (Case-6.)	CONDITION-2 (Case-6)	CONDITION-3 (Case-5)	CONDITION-4 (Case-7)				
			NR AT 40% LOAD	NR AT 100% LOAD	NR AT 40% LOAD	NR + Intermittent Requirements				
	1.0	INLET OF PRV								
rinjan inversi	1.1	PRESSURE (kg/cm ² a)	16.80	41.37	16.80	41.37	ng militan i amakin ang papakan ana ngangan kilangan pakin ana papakan kilan dalah 190 militan dalah 190 milita			
	1.2	TEMPERATURE (°C)	315.9	343.7	315.9	343.7				
Manage statement	1.3	FLOW (T/Hr)	48.47	48.47	58.69	75.79	ada arman a de folia qui impair (qui - Campai a plaia implicati de la mispella de a de consepcio de de Cambrillo (qu			
	2.0	OUTLET OF PRV								
- Carpania	2.1	PRESSURE (kg/cm ² a)	16.00	16.0	15.94	16.00				

NOTES :-

- 1. VALVE SELECTED SHALL BE SUITABLE FOR PASSING 79.4 T/H AT RATED PARAMETERS.
- 2.CONDITION 3 IS THE CAPABILITY CHECK POINT

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CONTROL VALVE SPECIFICATION SHEET

(IN ACCORDANCE WITH LS A FORM \$20.51)

PROJECT: NTPC LTD. BONGAIGAON TPP (3x250 MW)	CUST.No: 6990,6991&6992
GENERAL:THIS IS TO BE READ ALONG WITH TECH 1. Valve tag No. CD-15 2. Service : SPRAY WATER	HNICAL SPECIFICATION PC: TSP: BONGAI: 001, 5. Manufacturer: * 002 & 003
COMMON BLOCK VALVE. 3. Line No./Vessel No. :	7. Rating : ASME CL.800 8. Total Qty
4. Qty. required per unit: ONE BODY:	Required : 1 No
9. Type: Thru 3 Way Z type Angle	16. Bonnet type: Standard Finned Extended Pr. seal
10. Form: Globe Ball Butterfly 11. Size *	17. Material : Body : SA105 Packing: GRAFOIL
12. Port Size : *	Bolting: * 18. Flow direction : HORIZONTAL
13. Connecting pipe size : Inlet : OD 60.3 x 5.54 Outlet : OD 60.3 x 5.54 14. Body rating : ASME CL.800	19. Suitable matching pieces to match with pipe size specified shall be offered.
15. Type of end connections : Screwed NPI Flanged ANSI Edge Preparation as per BPS.	BW SW BSPT BS DIN
TRIM: 20. No. of ports : * 21. Type : Balanced	24. Stem material : 316 SST Strain Hardened 25. Plug material : 17.4 PH SST/416C SST 27. Disc material : OR EQUIVALENT 28. stem guide material : 29. —
ACTUATOR: 30. Type: Electric Pneumatic	34. Diaphragm/Cylinder pressure at Valve full open : * Valve full close :
Hydraulic DA/RA(Air To Close)	35. Force required for process & . * Force available at actuator.
31. Size : * 32. Supply : 45 PSIG 33. Failsafe position : Stayput of valve. Full Close Full Open	36. Actuator sizing $\triangle P$: * 37. If actuator electric fill in data sheet as per annexure : NAPL furnished and shall comply with annexure—I specification.
00 12.10.09 FRESH ISSUE FAR MESH R.PRABHAF C V N REV DATE ALTERATION PREPARED APPD./C&I APPROVEI	DRG. NO: REV 4-00-306-38762 OC

POSITIONER: NOT REQUIRED	10. If Pneumotic Type : *
38. Type: Pneumatic Electronic	Split range : Yes No
DA/RA Electro Pneumatic	Controller Input & Controller Signal Value : 4-20 mA
39. If Electronic : Type :	Output Signal Value 3 45 PSIG
Model : Solid plate deversing	Input/Output Pr. guage :
Main contactor : Solid state thyristor:	Required :Yes No
Relay Switching:	By pass provision : Yes No Action : Direct Reverse Both
	Cam : =% Linear Both
Also refer annexure — II	and the second s
position indicator reqd. for Valve & VÇB	
ACCESSORIES:	49. Position transmitter : Yes No No
41. Handwheel : Yes Side Top	Flectronic F
42. Air filter : Yes No	Type : Pnuematic : Non contact type
Filter Size : 5 Micron 25 Micron	Rating: 2 wire 24V DC:
43. Limit Switches : Yes No	Output: 4-20 ma : 3-15 paig
Qty. : 1 at full open & : 1 at full close	50. Torque Switches : Yes No 14
Rating : 240v. 5Amp. ac	Rating :
No of contacts per switch : 2No + 2NC	51. Air lock :Yes No
44. Solenoid valve as pilot device	Function : TO EFFECT STAYPUT
Stayput : Yes No	Type 🛠 :3 Way single acting 🔲
Type :4 Way Dual coil Universal: Yes No	:3 Way double acting
Rating: 24V DC 2 wire	52. Ambience : Dusty corrosive
Class H coil : Yes No	53.1. Local position Indicator: Required.
45. Vol. booster : Yes No	53.2. I/P converter with : Not Required
46. Travel time : < 10 Sec.	A/F regulator 53.3 Integral JB : 36 Way JB required
47. Installation : Indoor Outdoor	2 No s of 9 pin plug & socket connector.
48. All accessories enclosure : *	1 No of 5 pin plug & socket connector. 53.4 All electrical terminating : plug & socket type
MISCELLANEOUS:	57. Valve sizing as per
54. Seat leakage: ASME FCI/RP 70.2 CLASS V	ISA 75.01 :Yes No S8. Noise Level :Less than 85 DBA at 1m
I.S.A :	from Valve & Piping System.
56. Space requirements for : *	59. Intertubing Diagram : As per Enclosed. 60. Performance Data
online servicing	Linearity: ± 1 % Hyterisis: ± 0.5 % Sensitivity: ± 0.5 % Accuracy (overall): ± 2 %
VALVE SIZING DATA:	Solishing . I U.S % Accuracy (Overall) : I Z %
61. Medium : SH Steam Sat. Steam Water	CONDITION 1 2 3 4 5
62. Flow rate in T/Hr	REFER DRAWING No.
63. Operating inlet pressure in Kg/cm²(a) 64. Operating inlet temperature in C	4-00-306-38762 SHT 4 OF 4
65. Outlet pressure in Kg/cm² (a)	FOR VALVE SIZING DATA
66. Viscosity : 67. Operating (required) Cv	REFER STANDARD TABLE X X X X X
68. Operating noise level at 1.0 metre from valve	<85 dba (for dll conditions)
69. Outlet velocity surface	DRG. NO: REV
12.10.09 PARANESH R.PRABHA C V N DATE PREPARED APPD./C&I APPROVED	4-00-306-38762 00
ATTENDED ATTENDED	SHEET 2 OF 4

ESI	GN DATA:	
0.	Design Pressure $Kg/cm^2(g)$: 30 $Kg/Cm^2(g)$	75. lift at various operating
1.	Design Temperature "C : 55"C	Conditions 1 TO 6 : *
2.	Rated/Design/Selected Cv of valve : *	76. Down stream limitations *
3.	Velocity restriction: *	77. Up stream limitations : *
4.	Operating lift restriction : —	78. Increase in signal Air : To open the Valve
ES.	TING/INSPECTION: (AS PER M/S NTPC APPROVE	ED QUALITY PLAN:)
79.	Hydraulic test report : Yes 🗹 No 🗌	84. Accessories functional : Yes 🔽 No
30.	Radiography : Critical Parts : Total	Test :
	Not required :	85. Seat leakage test : Yes No
31.	IBR test report : Reqd. :	86. Material test report : Yes No
82.	Type test : Capacity Evoluation by *	87. Customer Inspection :
	ISA S39.2/5 39.4 : Required.	In process : Yes No
83.	Valve functional test : Yes No	Final : Yes No
*	Type test to be done atleast for one no on this consignment.	88. Third Party inspection : Yes No
DOC	CUMENTATION: (Required)	
89.	With bid. (3 sets)	91. With equipment :
	Catalogues : Yes No	Dimensional drawing: 15 Sets
	Dimensional drawing : Yes 🚺 No 🗌	O & M :do
	All data sheets : Yes 🚺 No 🗌	Data Sheets :do
	Recommendation /	Test certificate : 1RTF + 3 Sets
	Limitation : Yes No	92. Valve sizing, actuator sizing,
	Confirmatory report : Yes No	noise level calculations required
	Contrary report : Yes No	with bid(with formulae): Yes No
	Deviation report : Yes No	93
90.	Quality plan : Yes No	
	ARES:	96. 2/3 Years maintenance spares : *
94.	. Commissioning spares : * . Mandatory spares : As per specification	
01 97	r HERS: '. Bidders experience list : F	Required Not required
98	B. Operational feed back of such	
	• •	Required Not required
99	. – 1. (Required Not required Required Not required
	of. System guarantee 11. <u>Service contract for 5 Years : — To quote sep</u> e	erately
		Required Not required
N	OTES:	
1.	* DENOTES BIDDER TO SPECIFY	
12.	10.09 PARAYESH R.PRABHA PO C V N	DRG. NO: 4-00-306-38762
Discourse of the last	DATE PREPARED APPD./C&I APPROVED	1 00 000 00/02 1

		modifymaticaphymatica				Transportation of the leading of the	The second secon								en entre de estano en	 -	1
			CONDITION-8	NORMAL RUNNING+INTE RMITTENT REQT.)		23	49			+ -	22	49	13,93	e de la companya de l			
			CONDITION-7	UP TO 40%		26	46				25	46	8.83				-
4-00-306-38762	SHEET NO. 4 OF 4		9-NOILION-0	UP TO 30% HOT START UP		26	46	in laked all Prison			25	46	12.90				
			CONDITTION-5	UP TO 30% COLD START UP		26	46				25	46	13.90		 		
,		oca-value-va	CONDITION-4	15% LOAD (HOT START)		26	46				25	46	10.22				
		NLVE)	CONDITION-3	15% LOAD (COLD START)		26	46				25	46	8.70				а Сог о
NO	MW)	CD-15(BLOCK VA	CONDITTION-2	(100 % + SECOND UNIT START-UP REQT. + INTERMITTENT REQT.)		23	49				22	24	22.90	The second of th			
ZING CALCULATI	SAIGAON (3 X 250	MON BLOCK VALVE	CONDITION-1	NORMAL REQT.		23	49				22	49	3.70			AND THE PROPERTY OF THE PROPER	
AUXILIARY PRDS SIZING CALCULATION	PROJECT TITLE: NTPC BONGAIGAON (3 X 250 MW)	SIZING DATA FOR COMMON BLOCK VALVE CD-15(BLOCK VALVE)		PARAMETERS	INLET OF VALVE	PRESSURE (kg/cm ² a)	TEMPERATURE (OC)	NOTITION OF SERVICE STATION	Colege of Stan Continue on		PRESSURE (kg/cm² a)	TEMPERATURE (°C)	FLOW (T/Hr)				
			ON 15		1.0	1.	1.2		3.	2.0	2.1	2.2	2.3				
	BILEL																

NOTE: THE VALVE WILL BE PROCURED SUCH THAT PR DROP SHOULD NOT EXCEED 1 KG/SQ.CM AT ANY CONDITION.

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CONTROL VALVE SPECIFICATION SHEET

PROJECT: (IN ACCORDA	ANCE WITH I.S.A. FORM S20.51)
NTPC LTD BONGAIGAON TPP(3x250 MW)	CUST.No: 6990,6991&6992
GENERAL:THIS IS TO BE READ ALONG WITH TECH 1. Valve tag No. CD-02 & CD-04 2. Service : HIGH capacity Spray Control valve 3. Line No./Vessel No. : 4. Qty. required : ONE	HNICAL SPECIFICATION PC: TSP: BONGAI:001002 5. Manufacturer : * & &003 6. Model No. : * 7. Rating : ASME CI 800 8. Total Qty Required : 1 No
BODY: 9. Type: Thru 3 Way 2 type Angle 10. Form: Globe Ball Butterfly 11. Size 12. Port Size (bidder to match size of control valve with connecting pipe size) 13. Connecting pipe size: Inlet: OD 60.3x5.54 Outlet: OD 60.3x5.54 14. Body rating: ASME CI 800	16. Bonnet type: Standard Finned Extended Pr. seal 17. Material: Body: A 105 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 Edge Preparation as per BPS.	BW SW BSPT BS DIN
TRIM: MULTI STAGE. 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 : 29. —
ACTUATOR: 30. Type: Electric Pneumatic Hydraulic DA/RA(Air To Close) 31. Size: * 32. Supply: 45 PSIG 33. Failsafe position: Stayput of valve. Full Close Full Open	 34. Diaphragm/Cylinder pressure at Valve full open: * Valve full close: 35. Force required for process & Force available at actuator. 36. Actuator sizing ΔP : * 37. If actuator electric fill in data sheet as per annexure : NAPL furnished and shall comply with annexure—I specification.
00 12/10/09 FRESH ISSUE FARAMESH R.PRAEMA C.V.NATHA REV DATE ALTERATION PREPARED APPROVED APPROVED	

POSITIONER: SMART SIEMEN MAKE MODEL NO: 6DR5211-0EN00-0AA0+6DR4004-8J	40. If Pneumotic : Type : *
38. Type : Pneumatic	Model: * Split range : Yes No No
DA/RA Electro Pneumatic	Controller Input & Controller Signal Value : 4-20 mA
39. If Electronic : Type : (Smart)	Air supply : 45 PSIG
Model : Solid plate deversing	Input/Output Pr. guage:
Main contactor: Solid state thyristor:	Required :Yes No
busersely "	By pass provision : Yes No Action : Direct Reverse Both
Relay Switching :	Cam : =% Linear Both
Also refer annexure — II	V (11) 70 Land 2011 Land 2011 Land
position indicator reqd. for Valve & VOR	
ACCESSORIES:	49. Position transmitter : Yes No
41. Handwheel : Yes 🔽 Side 🔽 Top 🗌	
42. Air filter : Yes No	Type : Pnuematic : Electronic Non contact type
Filter Size : 5 Micron 25 Micron	Rating: 2 wire 24V DC:
43. Limit Switches : Yes No	Output : 4—20 ma : 3—15 paig
Qty. : 1 at full open &	50. Torque Switches :Yes No
: 1 at full close	Qty. : Roting :
Rating : 240v. 5Amp. ac	51. Air lock :Yes No
No of contacts per switch : 2No + 2NC	Function : TO EFFECT STAYPUT
44. Solenoid valve as	Type ☀ :3 Way single acting
Stayput : Yes No	:3 Way double acting
Type : 3 Way universal: Yes No	52. Ambience : Dusty corrosive
Rating: 24V DC 2 wire	Toxic hazardous :
Class H coil : Yes No 45. Vol. booster : Yes No	53.1. Local position Indicator: Required.
46. Travel time : <10 sec	53.2. I/P converter with : Not Required
47. Installation : Indoor Outdoor	A/F regulator (FAIL FREEZE TYPE) 53.3 Integral JB : 36 Way JB required
48. All accessories enclosure : *	2 No s of 9 pin plug & socket connector. 1 No of 5 pin plug & socket connector.
MISCELLANEOUS:	57. Valve sizing as per
54. Seat leakage : ASME FCI/RP 70.2 CLASS V	ISA 75.01 :Yes No
I.S.A:	58. Noise Level :Less than 85 DBA at 1n from Valve & Piping System
55. Approx. weight (total) : *	59. Intertubing Diagram : As per Enclosed.
56. Space requirements for : *	60. Performance Data Linearity: ± 1 % Hyterisis: ± 0.5
online servicing	Sensitivity: ± 0.5 % Accuracy (overall): ± 2
VALVE SIZING DATA: 61. Medium : SH Steam Sat. Steam	CONDITION
Water	1 2 3 4 5
62. Flow rate in T/Hr 63. Operating inlet pressure in Kg/cm²(a)	REFER DRAWING No.
64. Operating inlet temperature in C	4-00-300-3636 Still 4 01 4
65. Outlet pressure in Kg/cm² (a)	FOR VALVE SIZING DATA REFER STANDARD TABLE
66. Viscosity : 67. Operating (required) Cv	* * * * * *
68. Operating noise level at 1.5 metre	<85 dba (for all conditions)
69. Outlet velocity	DRG. NO: RI
DATE PREPARED APPROVED APPROVED	I I
L THE THE PART OF	SHEET 2 0

	ESIGN DATA:	
Page Hydraulic test report Yes No	1. Design Temperature 'C : 55 °C 2. Rated/Design/Selected Cv of valve : * 3. Velocity restriction : *	Conditions 1 TO 6 : * 76. Down stream limitations : * 77. Up stream limitations : *
Not required :	TESTING/INSPECTION:	
89. With bid. (3 sets) Catalogues: Yes V No Dimensional drawing: 15 Sets O & M :do Dota Sheets:do Test certificate: 1RTF + 3 Sets 92. Valve sizing, actuator sizing, Cavitation check, noise level calculations required with bid(with formulae): Yes V No Deviation report: Yes V No Deviation report: Yes V No SPARES: 94. Commissioning spares: * 95. Mandatory spares: As per specification OTHERS: 97. Bidders experience list: Required Not required Not required P9. Equipment guarantee: Required Not requ	Not required: Not required: Total	Test: 85. Seat leakage test: Yes No
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	89. With bid. (3 sets) Catalogues : Yes No Dimensional drawing : Yes No All data sheets : Yes No Catalogues : Yes No Catalogu	Dimensional drawing: 15 Sets 0 & 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
101. Service contract for 5 Years : — To quote seperately 102. Commissioning of the valves : Required Not required NOTES:	97. Bidders experience list : R 98. Operational feed back of such valves supplied elsewhere : F 99. Equipment guarantee : F 100. System guarantee : F 101. Service contract for 5 Years : — To quote sependate. F 102. Commissioning of the valves : F	Required Not required

NATION PROJECT TITLE: NIPC BONGAIGAON (3 x 250 MW) SIRING DATA FOR HIGH TEMP SPRAY CONTROL VALVE CD-2C,CD-04 SIZING DATA FOR HIGH TEMP SPRAY CONTROL VALVE CD-2C,CD-04 SIZING DATA FOR HIGH TEMP SPRAY CONTROL VALVE CONDITION-3 CONDITION-4 IS %LOAD, (HOT) COLD INTERMITTENT INTE		AUXILIARY PRDS SIZING CALCULATION	ZING CALCULATIC	Z				4-00-306-38583
SIZING DATA FOR HIGH TEMP SPRAY CONTROL VALVE CD-02, CD-04 CONDITION-1 CONDITION-2 CONDITION-3 CONDITION-2 (15% LOAD) (3	PROJECT TITLE: NTPC BONG	AIGAON (3 X 250 N	(M)				
CONDITION-1 CONDITION-3 CONDITION-4		SIZING DATA FOR HIGH	1 TEMP SPRAY CONT	ROL VALVE CD-02	2,CD-04			
13% LOAD (19% LOAD)	CIV		CONDITION-1	CONDITION-2	CONDITION-3	CONDITION-4	CONDITION-5	de des la companya de la companya d
INLET OF VALVE	OL TO		(15% LOAD) (Case-1)	(30% LOAD) (HOT/ COLD) (Cases -3 & 4)	(NORMAL RUNNING + INTERMITTENT REQT.) (Casc-7)	ED	15 % LOAD, (HOT START) (Case- 2)	
PRESSURE (kg/cm² a) 25 25/25 22 22 TEMPERATURE (°C) 46 46 49 49 49 OUTLET OF SPRAY CONTROL STATION PRESSURE (kg/cm² a) 24 24/24 21 21 TEMPERATURE (°C) 46 49 49 49 FLOW (T/Hr) 3.31 7.6/5.62 8.40 13.42	-	INT ET OF VALVE						
PRESSURE (kg/cm² a) 25 22 22 TEMPERATURE (°C) 46 46/46 49 49 OUTLET OF SPRAY CONTROL STATION 24 24/24 21 21 PRESSURE (kg/cm² a) 24 24/24 21 21 TEMPERATURE (°C) 46 46/46 49 49 FLOW (T/Hr) 3.31 7.6/5.62 8.40 13.42				-				ones procedures — p q. k. dai in antichiare Vitta di de Schiero de Representa de Carlos de Carlo
TEMPERATURE (°C) 46 46/46 49 49 OUTLET OF SPRAY CONTROL STATION 24 24/24 21 21 PRESSURE (kg/cm² a) 46 46/46 49 49 TEMPERATURE (°C) 3.31 7.6/5.62 8.40 13.42 FLOW (T/Hr) 3.31 7.6/5.62 8.40 13.42	4.	PRESSURE (kg/cm ² a)	25	25/25	22	22	25	сили (интернетительность в данным верейный на терейный посторий польта в посторий посторий посторий посторий п
OUTLET OF SPRAY CONTROL STATION 24 24/24 21 21 PRESSURE (kg/cm² a) 46 46/46 49 49 TEMPERATURE (°C) 3.31 7.6/5.62 8.40 13.42	1.2	TEMPERATURE (°C)	46	46/46	0,4	49	94	arden seemen en propriet en de construction de construction de construction de construction de construction de
PRESSURE (kg/cm² a) 24 24/24 21 21 TEMPERATURE (°C) 46 46/46 49 49 FLOW (T/Hr) 3.31 7.6/5.62 8.40 13.42	1.3	OUTLET OF SPRAY CONTROL ST	ATION					
PRESSURE (kg/cm² a) 24 24/24 21 21 TEMPERATURE (°C) 46 46/46 49 49 FLOW (T/Hr) 3.31 7.6/5.62 8.40 13.42	2.0					Albert Schause and Schause		AND THE REAL PROPERTY OF THE P
TEMPERATURE (°C) 46 46/46 49 49 FLOW (T/Hr) 3.31 7.6/5.62 8.40 13.42	2.1	PRESSURE (kg/cm ² a)	24	24/24	27	21	24	adepartumente esta esta se personare el enterencia di dalegno. A distinuone pelocampo de manifessarore resistr
FLOW (T/Hr) 3.31 7.6/5.62 8.40 13.42	2.2	TEMPERATURE (°C)	46	46/46	49	49	46	opassej om kolopetum sama kitetit i umedende sig ikkepanasejda ali kisjinidji pridskipinijudimas edebiro
	2.3	FLOW (T/Hr)	3.31	7.6/5.62	8.40	13.42	4.42	
								ere en
								одиници надалення выполня положения выполня надалення выполня надалення выполня надалення выполня надалення надалення выполня надалення
こうしょ かいしゅう かんしゅう かんしゅん かんしん かんし		NOTE: THE VALVE WILL BE PROCURED SUCH THAT FR DROF SHOOLD INC. EXCELS 1137 257	CORED SOCE IDAI	FR DROF 5110 or	10 11 0 1 100 to 50 miles and 10 10 10 10 10 10 10 10 10 10 10 10 10	A STATE OF THE PERSON NAMED OF THE PERSON NAME		AND THE RESIDENCE OF THE PROPERTY OF THE PROPE

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CONTROL VALVE SPECIFICATION SHEET

PROJECT: NTPC LTD BONGAIGAON TPP (3x250 MW)	CUST.No: 6990,6991&6992
GENERAL:THIS IS TO BE READ ALONG WITH TEC 1. Valve tag No. : CD-08 & CD-11 2. Service : LOW CAPACITY SPRAY CONTROL VALVE 3. Line No./Vessel No. : 4. Qty. required : ONE	HNICAL SPECIFICATION PC: TSP: BONGAI:001002 5. Manufacturer : * & &003 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	16. Bonnet type: Standard Finned Extended Pr. seal
Butterfly 11. Size : * 12. Port Size : * (bidder to match size of control valve with connecting pipe size) 13. Connecting pipe size : Inlet : OD 48.3 x 5.08 Outlet : OD 48.3 x 5.08 14. Body rating : ASME CL. 800	17. Material : Body : A 105 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 SW BSPT BS DIN
TRIM: MULTI STAGE. 20. No. of ports : * 21. Type: Balanced Unbalanced 22. Plug characteristics: L/LY/EP / MODIFIED EP 23. Guiding: Cage Port Top Bottom	24. Stem material : 316 SST Strain Hardened 25. Plug material : 17.4 PH SST/ 440C SST 27. Disc material : OR EQUIVALENT 28. stem guide material : 29.
ACTUATOR: 30. Type: Electric Pneumatic Hydraulic DA/RA(Air To Close 31. Size: * 32. Supply: 45 PSIG 33. Failsafe position: Stayput of valve. Full Close Full Open	34. Diaphragm/Cylinder pressure at Valve full open: * Valve full close: 35. Force required for process & . * Force available at actuator. 36. Actuator sizing ΔP : * 37. If actuator electric fill in data sheet as per annexure : NAPL furnished and shall comply with annexure—I specification.
00 12/10/09 FRESH ISSUE PARAMESH R.PRABHA C.V.NATH REV DATE ALTERATION PREPARED APPROVED APPROV	

Anno processor and the second section of the section of	POSITIONER: SMART SIEMEN MAKE MODEL NO: 6DR5211-0EN00-0AA0+6DR4004-8J	10. If Pneumatic : Type : *
CEPTRAL SECURIOR SECU	38. Type: Pneumatic Electronic	Model: * Split range : Yes No
SANCTON STANCTON	DA/RA Electro Pneumatic	Controller Input & Controller Signal Value : 4-20 mA
Acceptations of the control of the c	39. If Electronic : Type :	Output Signal Value Air supply : 45 PSIG
AARA ETI DERTO KERTO DE TOTO D	Model : Solid plate deversing contactors	Input/Output Pr. guage:
	Main contactor : Solid state thyristor:	Required : Yes No By pass provision : Yes No No
ENDODONOMICO DE CONTROLO DE CO	Relay Switching :	Action : Direct Reverse Both
ALES RESIDENTES ESTREMENTO	Also refer annexure 11	Cam : =% Linear Both
SANCER PROPERTY OF THE PROPERT	position indicator reqd. for Valve & VCB	
	ACCESSORIES:	49. Position transmitter : Yes No
	41. Handwheel : Yes Side Top	Flectronic Co
	42. Air filter : Yes No	Type : Pnuematic : Non contact type
A MARKA	Filter Size : 5 Micron 25 Micron 43. Limit Switches : Yes No	Rating: 2 wire 24V DC:
		Output: 4—20 ma : 2 3—15 paig 50. Torque Switches :Yes No
*	Qty. : 1 at full open & : 1 at full close	. Qty. :
THE PROPERTY OF THE PROPERTY O	Rating : 240v. 5Amp. ac	Rating : 51. Air lock :Yes No
редверативания	No of contacts per switch : 2No + 2NC	Function : TO EFFECT STAYPUT
	44. Solenoid valve to effect	Type :3 Way single acting
Harriman Harriman	Stayput : Yes No	:3 Way double acting
000000	Type : 3 Way universal: Yes 🛂 No	52. Ambience : Dusty corrosive
MODIFICATION	Rating: 24V DC 2 wire	Toxic hazardous :
5-015-000000000000000000000000000000000	Class H coil : Yes No 45. Vol. booster : Yes No	53.1. Local position Indicator: Required.
HORELD VARIABLE DATE OF THE PARTY OF THE PAR	46. Travel time : < 10 Sec	53.2. I/P. converter with : Not Required A/F regulator (FAIL FREEZE TYPE)
	47. Installation : Indoor Dutdoor	53.3 Integral JB : 36 Way JB required
	48. All accessories enclosure : *	2 No s of 9 pin plug & socket connector. 1 No of 5 pin plug & socket connector.
	MISCELLANEOUS:	57. Valve sizing as per
THE PROPERTY OF THE PROPERTY O	54. Seat leakage: ASME FCI/RP 70.2 CLASS V	ISA 75.01 : Yes No 58. Noise Level :Less than 85 DBA at 1m
- Consequence of the Consequence	I.S.A: 55. Approx. weight (total) : *	from Valve & Piping System.
Rice-Section (55. Approx. weight (total) : * 56. Space requirements for : *	59. Intertubing Dlagram : As per Enclosed. 60. Performance Data
TST-TATE OF THE TST-TATE OF TST-TATE O	online servicing	Linearity: ± 1 % Hyterisis: ± 0.5 % Sensitivity: ± 0.5 % Accuracy (overall): ± 2 %
Athensesson	VALVE SIZING DATA:	
WORKSTON, CO.	61. Medium : SH Steam Sat. Steam Water	CONDITION 1 2 3 4 5
	62. Flow rate in	REFER DRAWING No.
	63. Operating inlet pressure in Kg/cm² (a) 64. Operating inlet temperature in C	1 4 00 300 30304 Silt 4 01 4
	65. Outlet pressure in Kg/cm² (a)	FOR VALVE SIZING DATA REFER STANDARD TABLE
	66. Viscosity : 67. Operating (required) Cv	
	68. Operating noise level at 1.5 metre 69. Outlet velocity	<85 dba (for dll conditions) * * * * * *
	12/10/09 12 PA Can	DRG. NO: REV
	DATE PREPARED APPROVED APPROVED	1 4-00-30304 00
1		SHEET 2 OF 4

DESIGN DATA:	
70. Design Pressure Kg/cm ² (g) : 30 Kg/Cm ² (g)	75. lift at various operating
71. Design Tem perature 'C : 55 °C	Conditions 1 TO 6 ; *
72. Rated /Des ign/Selected Cv of valve ; *	76. Down stream limitations : *
73. Velocity restriction: *	77. Up stream limitations : *
74. Operat ing lift restriction: 15 to 80 %.	78. Increase in signal Air : To open the Valve
TESTING/INSPECTION:	
79. Hydraulic test report : Yes No	84. Accessories functional : Yes No
80. Radiography : Critical Parts : Total	Test :
Not required :	85. Seat leakage test : Yes 🗹 No 🗌
81. IBR test report : Reqd. :	86. Material test report : Yes No
82. Type test: Capacity Evoluation by	87. Customer Inspection :
ISA S39.2/5 39.4 : Required.	In process : Yes No
83. Valve functional test : Yes No	Final : Yes No
	88. Third Party inspection : Yes No
DOCUMENTATION: (Required)	
89. With bid. (3 sets)	91. With equipment :
Catalogues : Yes No	Dimensional drawing: 15 Sets
Dimensional drawing : Yes No	0 & M :do
All data sheets : Yes No	Data Sheets :do
Recommendation /	Test certificate : 1RTF + 3 Sets
Limitation : Yes No	92. Valve sizing, actuator sizing,Cavitation check,
Confirmatory report : Yes 🗹 No	noise level calculations required
Contrary report : Yes 🗹 No	with bid(with formulae): Yes No
Deviation report : Yes 🗗 No] 93
90. Quality plan (enclosed) : Yes 🗹 No	
SPARES: 94. Commissioning spares : *	96. 2/3 Years maintenance spares : *
95. Mandatory spares : As per specification	
OTHERS: 97. Bidders experience list : R	Required Not required
98. Operational feed back of such	not required [
valves supplied elsewhere : R	Required Not required
	Required Not required Required Not required
101. <u>Service contract for 5 Years : — To quote sepe</u>	· · · · · · · · · · · · · · · · · · ·
	Required Not required
NOTES:	
1. * DENOTES BIDDER TO SPECIFY	
12/10/09 bg Pf Can	DRG. NO:
PARAMESH R,PRABHA/ C.V.NATHA DATE PREPARED APPROVED APPROVED	4-00-306-38584

			AND THE PARTY OF T			одна у продержава одного поставления в поставления в поставления в поставления в поставления в поставления в п		Construction of the Constr				одиниция в образования в в народника в принциперации в народника в принциперации в принциперац		e de la composition della comp			AAAA PRINCES OF STORMS (ATT ANT ANT ANT ANT ANT ANT ANT ANT ANT	
			CONDITION-8		NORMAL REQT+ INTERMITTENT REQ		22	Ç	D)		**	1.7	0,4	5.5				
			CONDITION-7		UP TO 40%		25	*	46			24	46	3.9				
4-00-306-38584	SHEET NO. 4 OF 4		CONDITION-6		30% LOAD (COLD START)		25		46			24	46	7.0				
F			CONDITION-5		15% LOAD (COLD START)		20	3	46			24	. 46	4.0				
- management of the second			CONDITION-4		15% LOAD (HOT START)		30	67	46			24	46	5.85				
		08,CD-11	CONDITION-3	+ % 0017	SECOND UNIT START-UP REQT. + INTERMITTENT REQT.)		6	777	49			72	49	9.57				
ZO	AW)	ROL VALVE CD-	C.NOITIONO		NORMAL REQT.			22	49			24	. 49	3.69				
IZING CALCULATI	GAIGAON (3 X 250 P	W TEMP SPRAY CON	I MOTERCIACO	CONDITIONEL	30% LOAD (HOT START)			22	46	TATION		24	46	7.38				
AUXILIARY PRDS SIZING CALCULATION	PROJECT TITLE: NTPC BONGAIGAON (3 X 250 MW)	SIZING DATA FOR LOW TEMP SPRAY CONTROL VALVE CD-08,CD-11			PARAMETERS	371 TA 17 TO THE TAXE	INEEL OF VALVE	PRESSURE (kg/cm ² a)	TEMPERATURE (°C)	OUTLET OF SPRAY CONTROL STATION		DDESCIBE (kg/cm ² a)	TRANSPORTING (PC)	115711 11511 (() () () () () () () () ()	FLOW (1/ ht)			
	BHEL			SL.NO.			o.	£	1.2	1.3	2.0	10	2.2	1 0	2.3			

NOTE: THE VALVE WILL BE PROCURED SUCH THAT PR DROP SHOULD NOT EXCEED 1 KG/SQ.CM AT ANY CONDITION.

NTPC LTD BONGAIGAON THERMAL POWER PROJECT

L.T. DESUPERHEATER SPECIFICATION SHEET

Designation/Tag No 01.

: Auxiliary steam line / DESH - 02

02. Quantity Required

: One

Turndown ratio 0.3.

: Bidder to specify

Material 04.

: ASTM A 106 Gr B

05. Inlet connection/Outlet connection? (Steam side)

: \$273 x 6.35 , STYLE= 'D' d1=260.3 : $\emptyset 273 \times 6.35$, STYLE= 'D' d1=260.3(bidder to match with the given d1 values)

06. End connection (Steam side)

: Butt Welded

07. Spray water connection

: OD 48.3 x 5.08

(bidder to match size of control valve with

connecting pipe size)

08. End connection

: Butt Welded / Socket Welded

09. Mounting arrangement

: VERTICAL (FLOW FROM TOP TO BOTTOM)

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.4-00-306-38586 sht 2 of 2

13 . Design Pressure

: 20 Kg / cm² (g)

14. Design Temperature

: 350 °C

15. Minimum distance required in D/S angleof DESH for temp. control sensing \ element

: BIDDER TO SPECIFY

16. Minimum distance required in D/S . BIDDER TO SPECIFY of DESH for pressure control sensing element

17. IBR Certification required

: Yes

18. Testing/Inspection

: As per purchaser approved vendor QP

19. Documents required during offer :

Catalogues, filled up data sheets, Sizing calculations, Turn down ratio calculation, Detailed drawing with BOM, Material specifications, Weight, Special requirements such as 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, Test certificates as per QP and 0 & M manual.

20 sets plus 3 sets of CD's

1			/		
	1.00		(CU)	DRG. NO:	REV
12/10/09	PARAMESH	R.PRABHA	C.V.NATHAN	4 00 700 70E00	100
DATE	PREPARED	APPROVED	APPROVED	4-00-306-38586	100
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			NON-SE	IAL TERMI REQ					Construction of the Constr			*						
			N-7 CONDITION-8	NORMAL % REQT+INTERMI TTENT REQ		16	310	29.0	Appendix processors and processors a	16	210	64.4			7	49	5.4	
			CONDITION-7 (CASE-5)	r UP TO 40%		16	310	41.9		16	210	45.8		*********	24	46	9.6	
	2		CONDITION-6 (CASE-4)	UP TO 30% HOT START UP		16	310	80.2		9	210	87.6	anton Malyana a ,		24	46	7.4	
4-00-306-38586	SHEET NO. 2 OF 3	phones are a second sec	CONDITION-5 (CASE-3)	15% LOAD (HOT UP TO 30% COLD START)		16	310	70.1		ð	210	83.1			24	46	6.5	
			CONDITION-4 (CASE-2)	15% LOAD (HOT START)	and the second	91	310	63.27		9	210	69.1			24	46	5.80	
		IX. STEAM HEADE	CONDITION-3 (CASE-8)	(100 % + SECOND UNIT START-UP REQT. INTERMITTENT REQT.)		91	310	103.55		10	210	13.1			21	49	9.57	
ATION	:50 MW)	IGH & LOW TEMP. AL	CONDITION:2 (CASE-6)	NORMAL REQT.		9	310	38.28		16	210	41.78			2.6	49	3.50	.g/cm2
IZING CALCUL.	GAIGAON (3 X 2	TER BETWEEN H	CONDITION-1	15% LOAD (COLD START)		16	310	58.69		16	210	64.00	NO	ALVE	70	46	200	e sized for 30 k
AUXILIARY PRDS SIZING CALCULATION	PROJECT TITLE: NTPC BONGAIGAON (3 X 250 MW)	SIZING DATA FOR DESUPERHEATER BETWEEN HIGH & LOW TEMP, AUX. STEAM HEADER		PARAMETERS	INLET OF DESUPERHEATER	PRESSURE (kg/cm²a)	TEMPERATURE (OC)	FLOW (T/Hr)	OUTLET OF DESUPERHEATER	PRESSURE (kg/cm ² a)	TEMPERATURE (OC)	FLOW (T/Hr)	INI ET OF SPRAY CONTROL STATION	COUNTRY OF COMMON BLOCK VALVE	27.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.7.	PRESSONE (RE/ CIII A)	LEMPERATORE (C)	Note:1. Spray control systems shall be sized for 30 kg/cm2
			SL.NO.		1.0	*	1.2	1.3	2.0	2.1	2.2	2.3	3.0		Š	- 0		Note:1.
	7																	

NTPC LTD BONGAIGAON THERMAL POWER PROJECT (3x250 MW)

H.C. DESUPERHEATER SPECIFICATION SHEET

Designation/Tag No 01.

: Auxiliary steam line / DESH - 01

02. Quantity Required

One

03. Turndown ratio

: Bidder to specify

04. Material

: ASTM A 335 P22

05. Inlet connection/Outlet connection? $0.05323.9 \times 9.53$, STYLE= 'D', d1=304.8

(Steam side)

Ø323.9 x 9.53 , STYLE= 'D', d1=304.8

(bidder to match with the given d1 values)

06. End connection (Steam side)

: Butt Welded

07. Spray water connection : OD 60.3 x 5.54

(bidder to match size of control valve with

connecting pipe size)

08. End connection

: Butt Welded / Socket Welded

09. Mounting arrangement : HORIZONTAL

Minimum straight length required 10. U/S of Desuperheater

: BIDDER TO SPECIFY

Minimum distance required ? 11. downstream of DSH

: BIDDER TO SPECIFY

12. Sizing Parameters

: Refer 4-00-306-38585 sht 02 of 02

13 . Design Pressure

: 20 Kg / cm² (g)

14. Design Temperature

: 485 °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 ratio calculation, Detailed drawing with BOM, Material specifications, Weight, Special requirements such as Liner, Upstream & Downstream straight length, 0 & M manual Quality plan indicating various checks for raw material in process & final inspection stage.

20. <u>Documents required after Placement of Order</u>

Catalogues, Final detailed drawing with BOM, Material) 20 sets plus 3 sets of CD's specification, Weight, Final sizing, Turn down ratio calculation, Test certificates as per QP and 0 & M manual.

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12/10/09	PARAMISH	R.PRABHA	C.V.NATHAN		REV
DATE	PREPARED	APPROVED	APPROVED	4-00-306-38585)()[

BHEL.		AUXILIARY PRDS SI	ZING CALCULAT	ION				4-00-306-38585	
Construction of the Constr		PROJECT TITLE: NTPC BONG	GAIGAON (3 X 250	MW)				SHEET NO. 2 OF 2	virtae-ali kultolia duomo
		SIZING DATA FOR HIGH	CAPACITY DESUPE	RHEATER		and the second s			T
	SL.NO.		CONDITION-1	CONDITION-2	CONDITION-3	CONDITION-4	CONDITION-5		
		PARAMETERS	(15% LOAD) (Case-1)	(30% LOAD) (HOT/ COLD) (Cases -3 & 4)	(NORMAL RUNNING + INTERMITTENT REQT.) (Case-7)	UNIT START-UP	15 % LOAD, (HOT START) (Case 2)		
	1.0	INLET OF DESUPERHEATER				naryshaninikasuu sakirriirinaakir muskaakinna ajadyaiii kaysha			
	1.1	PRESSURE (kg/cm ² a)	16	16/16	16	16	16		
	1.2	TEMPERATURE (°C)	378.3	451.5 / 399	474.5	474.5	396.5		
	1.3	FLOW (T/Hr)	63.67	70.4/82.2	67.66	107.20	67.15		
	2.0	OUTLET OF DESUPERHEATER							
	2.1	PRESSURE (kg/cm ² a)	16	16/16	16	16	16		
	2.2	TEMPERATURE (°C)	310	310	310	310	310		1
	2.3	FLOW (T/Hr)	66.99	78.4/88.5	76.13	120.60	71.57		1
	3.0	INLET OF SPRAY CONTROL STATION (OUTLET OF COMMON BLOCK VALVE)		The Collision of the Property of the Collision of the Col					
	3.1	PRESSURE (kg/cm² a)	24	24/24	21	21	24		
	3.2	TEMPERATURE (°C)	46	46/46	49	49	46		
	3.3	FLOW (T/Hr)	3.31	8.02/6.02	8.47	13.42	4.56		

NOTES 1.High capacity PRDS shall have one reducing valve and desuperheater separately.

2. Spray control system shall be sized for 30kg/cm2

UX_PRDS_STATION.dwg

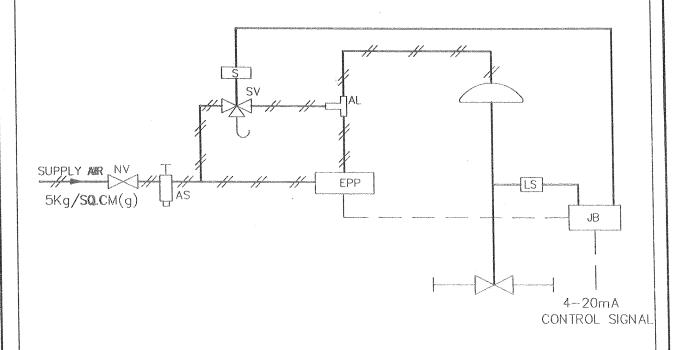


Bharat Heavy Electricals Limited Piping Centre Chennai-17

BONGAIGAON 3x250 MW

Specification No.	Rev.No.	Sheet	No.
PC:TSP:BONGAI:001	00	01 OF	01

PNEUMATIC HOOK UP DIAGRAM FOR CONTROL VALVE



EPP -ELECTRO PNEUMATIC POSITIONER SMART TYPE

AS - AIR SET

AL - AIR LOCK

JB - JUNCTION BOX

LS - OPEN & CLOSE LIMIT SWITCHES

NV - BRASS ISOLATION VALVE

SV - SOLENOID VALVE

S - SOLENOID COIL

NOTE:

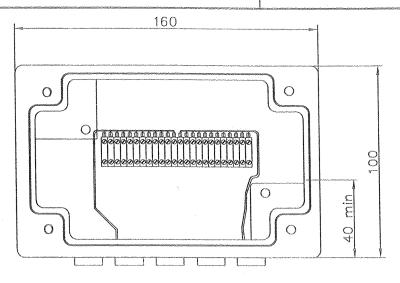
- i) ALL REQUIRED FITTINGS SHALL BE PROVIDED BY VENDOR.
- ii) SIZE OF VALVES / FITTINGS SHALL BE INDICATED BY VENDOR.

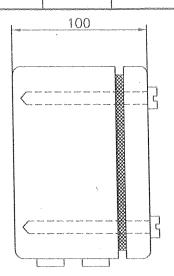
PREPA re d	CHECKED	APPROVED	DATE
PARAMESH	R. PRABHA	C.V.NATHAN	12/10/09



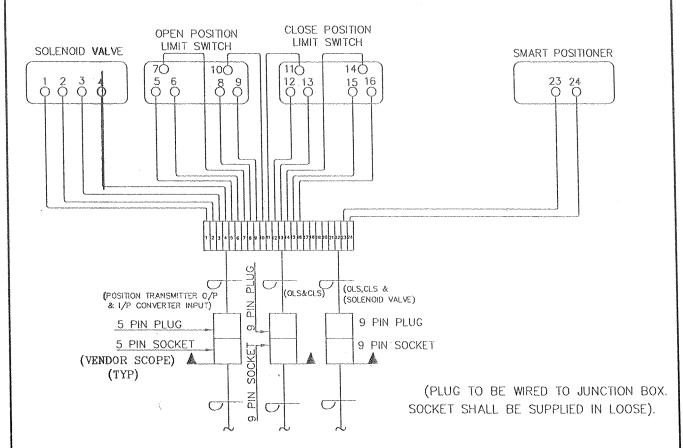
Bharat Heavy Electricals Limited Piping Centre Chennai-17

BONGAIGAON 3x250 MW	Specification No.	Rev.No.	Sheet No.
	PC:TSP:BONGAI:001	00	01 OF 02





JUNCTION BOX



TERMINAL BOX WIRING DIAGRAM

PREPARED	CHECKED	APPROVED	DATE
PARAMESH	R. PRABHA	C.V.NATHAN	12/10/09



Bharat Heavy Electricals Limited Piping Centre Chennai-17

BONGAIGAON 3x250 MW	Specification No.	Rev.No.	Sheet No.
	PC:TSP:BONGAI:001	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 POSITION TRANSMITTER 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 POSITION TRANSMITTER & 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
PARAMESH	R. PRABHA	C.V.NATHAN	12/10/09

AMMEXURE-D.

CLAUSE NO.	TECHNICAL REQUIREMENTS		
	CONTROL VALVES, ACTUATORS & ACCESSORIES		
1.00.00	CONTROL VALVES, ACTUATORS & ACCESSORIES		
1.01.00	General Requirements		
1.01.01	The control valves and accessories equipment furnished by the Bidder shall be designed, constructed and tested in accordance with the latest applicable requirements of code for pressure piping ANSI B 31.1, 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. All the Control Valves, their actuators and accessories to be furnished under this Subsection will be fully suitable and compatible with the modulating loops covered under the Specification.		
1.01.02	All the control valves and accessories offered by the Bidder shall be from reputed, experienced manufacturers of specified type and range of valves.		
1.01.03	This specification does not cover special type of control valves such as combined pressure and temperature control valve for Aux PRDS applications etc.		
1.02.00	CONTROL VALVE SIZING & CONSTRUCTION		
1.02.01	The design of all valve bodies shall meet the specification requirements and shall conform to the requirements of ANSI (USA) for dimensions, material thickness and material specification for their respective pressure classes.		
1.02.02	The valve sizing shall be suitable for obtaining maximum flow conditions with valve opening 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 the total valve stem travel. The sizing shall be in accordance with the latest edition of ISA handbook on control valves. While deciding the size of valves, Bidder shall ensure that valves trim exit outlet velocity as defined in ISA handbook does not exceed 8 m/sec for liquid services, 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 Employer's approval during detailed engineering.		
1.02.03	Control valves for steam and water applications shall be designed to prevent cavitation, wire drawing, flashing on the downstream side of valve and down stream 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.		
BONGAIGAON THERMAL POWER PROJECT (3X250 MW) STEAM GENERATOR WITH ELECTROSTATIC PRECIPITATOR PACKAGE TECHNICAL SPECIFICATIONS SECTION-VI, PART-B BID DOCUMENT NO.: CS-4610-101-2 ACCUATORS & ACCESSORIES			

(),..

CLAUSE NO.	TECHNICAL REQUIREMENTS TECHNICAL REQUIREMENTS			
1.02.04	Control valves for application such as SH Spray Control, RH spray Control, Heavy Oil Heating, pressurizing and Control system shall have permissible leakage rate as per leakage Class V. All other control valves shall have leakage rate as per leakage Class-IV.			
1.02.05	The control valve induced noise shall be limited to 85 dBA at 1 meter from the valve surface under actual operating conditions. The noise abatement shall be achieved by valve body and trim design and not by use of silencers.			
2.00.00	VALVE CONSTRUCTION			
2.01 .0 0	All valves shall be of globe body design & straightaway pattern with single or double port, unless other wise specified or recommended by the manufacturer to be of angle body type. Rotary valve may alternatively be offered when pressure and pressure drops permit.			
2.02.00	Valves with high lift cage guided plugs & quick-change trims shall be supplied.			
2.03.00	Cast Iron valves are not acceptable.			
2.04.00	Bonnet joints for all control valves shall be of the flanged and bolted type or other construction acceptable to the Employer. Bonnet joints of the internal threaded or union type will not be acceptable.			
2.05.00	Plug shall be of one-piece construction 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.			
2.06.00	All valves connected to vacuum on down stream side shall be provided with packing suitable for vacuum applications (e.g. double vee type chevron packing)			
2.07.00	Valve characteristic shall match with the process characteristics.			
2.08.00	Extension bonnets shall be provided when the maximum temperature of flowing fluid is greater than 280 deg. C.			
2.09.00	Flanged valves shall be rated at no less then ANSI press class of 300 lbs.			
3.00.00	VALVE MATERIALS			
	Sr. Service Body material Trim Material No.			
	1 Non- Carbon steel ASTM-A216 Gr. 316SS stellited with corrosive, WCB for fluid temperature stellited faced guide posts non-flashing below 275 Deg. C and bushings.			
STEA	THERMAL POWER PROJECT (3X250 MW) SECTION-VI, PART-B GENERATOR WITH TIC PRECIPITATOR PACKAGE TECHNICAL SPECIFICATIONS SECTION-VI, PART-B ACTUATORS & ACCESSORIES SUB-SECTION-IV:I-08 CONTROL VALVES, ACTUATORS & ACCESSORIES			

CLAUSE NO.	TECHNICAL REQUIREMENTS			
	and non- cavitation service	Alloy steel ASTM-A2170 WC9 for fluid temperatu above 275 Deg. C		
	2. Severe flashing/cavitation services	Alloy steel ASTM-A217 G WC9	Gr. 440 C	
	3. Low flashing/cavita tion service	Alloy steel ASTM-A217 (WC6	Gr. 17-4 PH SS	
*	4. Condensate, DM water service	316 SS	316 SS	
	NOTE Valve bod requiremen	y rating shall meet the procent as per ANSI B16.34.	ess pressure and temp	erature
	materials and in su including cavitation resistance and erosi	y offer valves with body and track cases Bidder shall furnistes resistance, hardness, tensile son resistance etc. of the offer r's consideration and approval	h the comparison of patrength, strain energy, and material vis-a-vis the	corrosion
4.00.00	END PREPARATION			
	Valve body ends shall be either butt welded/socket welded, flanged (Rubber lined for condensate service) or screwed as finalized during detailed engineering and as per Employer's approval. The welded ends wherever required shall be butt welded type as per ANSI B 16.25 for control valves of sizes 65 mm and above. For valves size 50 mm and below welded ends shall be socket welded as per ANSI B 16.11. Flanged ends wherever required shall be of ANSI pressure-temperature class equa to or greater than that of the control valve body.			
5.00.00	VALVE ACTUATORS 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 deg.C continuously.			
				e with the
	occurring under the specified. An adequirillimeter of seating	d stems shall be adequate to specified flow conditions or to tate allowance for stem force, g surface, shall be provided in unless otherwise specified.	he maximum differentia at least 0.15 Kg/sq.cm.	ıl pressure per linear
	The travel time of th	e pneumatic actuators shall no	t exceed 10 seconds.	
STEAM	HERMAL POWER PROJECT (3X250 MW) GENERATOR WITH C PRECIPITATOR PACKAGE	TECHNICAL SPECIFICATIONS SECTION-VI, PART-B BID DOCUMENT NO.: CS-4610-101-2	SUB-SECTION-IV:1-08 CONTROL VALVES, ACTUATORS & ACCESSORIES	PAGE 3 OF 6

CLAUSE NO.	TECHNICAL REQUIREMENTS		
6.00.00	CONTROL VALVE ACCESSORY DEVICES		
6.01.00	All pneumatic actuated control valve accessories such as air locks, hand wheels/hand-jacks, limit switches, microprocessor based electronic Positioner, diffusers, external volume chambers, position transmitters (capacitance or resistance type only), reversible pilot for Positioner, tubing and air sets, solenoid valves and junction boxes etc. shall be provided as per the requirements.		
7.00.00	SPECIFICATIO POSITIONER	NS FOR MI	CROPROCESSOR BASED ELECTRONIC
	Electrical	Input Signal	4-20 mA
		Power Supply	Loop Powered from the output card of Control System.
		Hart Protocol	Compatibility For Remote Calibration & Diagnostics(Super-Imposed Hart Signal On Input Signal(4-20 mA)
•	Birling date on This Gelfact of the Birline's Christian of The Gelfact of Christian of C	Valve Position Sensing	Position Sensing (Non Contact-Type),4-20 Ma O/P Signal For Control System To Be Provided
	Environment	Operating Temp	(-)30 To 80 Deg. C
	and considerate control from the rest of the control for the c	Humidity	0-95 %
	Jacob and Montener mail of times and non-inspect for all all falls for editing the William (AMP) of the William (A	Protection Class	IP-65 Minimum
	Software For Configuration And Diagnostic	Software	Windows Based Software. Software Shall Meet the Requirement For Configuration, Diagnostics, Calibration And Testing Of The Actuator
		Diagnostic/Test Features	Advanced Diagnostic Features Like Stroke Counter Or Travel Counter, Leakage In Actuators, On Line Partial Closure Test, Valve Signature Analysis, Step Response Test, Valve Friction /Jamming Detection Etc To Be Provided
	Factory Valve Signature Tests Reports (Pr Vs Valve Travel Vs I/P Signal) are to be provided.		
	Hardware	PC	For Configuration/Software Ref PC Specified Under DDCMIS Section
	Tests Certificates	Test certificates as per Manufacture Standard/Relevant Sta	
STEA	I THERMAL POWER PR (3X250 MW) M GENERATOR WITH TIC PRECIPITATOR PA	SECTION	SPECIFICATIONS ON-VI, PART-B OT NO.: CS-4610-101-2 SUB-SECTION-IV:I-08 CONTROL VALVES, ACTUATORS & 4 OF 6 ACCESSORIES

CLAUSE NO.	TECHNICAL REQUIREMENTS		
	Configuration/	uration/ Remote Calibration, Auto & Manual Calibration Shall Be Possible	
	Operating	Operating Range	Full Range & Split Range Signal Range
	Modes	Valve Action	Direct & Reverse. Valve Action
		Flow Characterization	Possible To Fit Valve Characteristic Curve Linear & Equal Percentage
	Fail Safe/Fail Freeze	Fail Safe/Fail Freeze Feature is to Be Provided.	
	Pneumatic	Air Capacity	Sufficient To Handle The Valves Selected/Boosters To Be Supplied If Required.
		Air Supply Pressure	To Suit The Air Supply Pressure/Quality Available.
٠.		Process Connection	1/4 Inch NPT
	Performance	Characteristic Deviation	<=0.5 % Of Span
	•	Ambient Temp Effect	<=0.01 %/Deg C Or Better
EMC & C Compliance		Required To International Standard Like EN/IEC.	En50081-2& En50082 Or Equivalent
	Accessories	In Built Operator Panel	Display With Push Buttons For Configuration And Display On The Positioner Itself (Password Protected/Hardware Lock)
		Hand Held Hart Calibrator	Universal Hart Calibrator To Be Provided, One Per Unit
		Press Gauge Block	For Supply & Output Pr., Filter Regulator Othe Accessories Shall Be Provided As On Required Basis For Making System Complete.
		Electrical Cable Entry	1/2-Npt,Side Or Bottom Entry To Avoid Water Ingress
		Valves Mounting Assembly	
STEA	I THERMAL POWER P (3X250 MW) M GENERATOR WITH TIC PRECIPITATOR P	SECTION DOCUMENT	SPECIFICATIONS ON-VI, PART-B OT NO.: CS-4610-101-2 SUB-SECTION-IV 1-08 CONTROL VALVES, ACTUATORS & 5 OF 6 ACCESSORIES

CLAUSE NO.	TECHNICAL REQUIREMENTS THE NTPC		
8.00.00	TEST AND EXAMINATION		
	All valves shall be tested in accordance with the quality assurance programme agreed between the Employer and Contractor, which shall meet the requirements o IBR and other applicable codes mentioned elsewhere in the specifications. The tests shall include but not be limited to the following:		
8.01.00	Non Destructive Test as per ANSI B-16.34.		
8.02.00	Hydrostatic shell test in accordance with ANSI B 16.34 prior to seat leakage test:		
8.03.00	Valve closure test and seat leakage test in accordance with ANSI-B 16.34 and as per the leakage class indicated above.		
8.04.00	Functional Test: The fully assembled valves including actuators control devices and accessories shall be functionally tested to demonstrate times from open to close position.		
8.05.00	CV Test: CV test shall be carried out as type test on each size, type and design of the valves as per ISA 75.02 standard and test report shall be furnished for Employer's approval.		
9.00.00	CONTROL VALVE QUANTITIES		
	Bidder shall furnish all the control valves under this main plant package as finalized during detailed engineering stage without any price repercussions whatsoever depending on the process requirements. All the control valves provided by the Bidder for this project shall meet the specifications requirements specified herein. Specification for control valves in this Sub-section has to be read in conjunction with other relevant Sub-sections of this specification.		
STEAM	THERMAL POWER PROJECT (3X250 MW) GENERATOR WITH IC PRECIPITATOR PACKAGE TECHNICAL SPECIFICATIONS SECTION-VI, PART-B ACTUATORS & 6 OF 6 ACCESSORIES		