CI 12/A

CONTROL VALVE SPECIFICATION SHEET

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

PROJECT:
BRBCL & NTPC LTD
NABINAGAR TPP (4x250 MW)

CUST.No: 6979,6980,6981&6982.

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION PC: TSP: NABI:003,004 &005

1. Valve tag No. : AS–10
2. Service : High capacity PR valve
3. Line No./Vessel No. :
4. Qty. required : ONE
5. Manufacturer : *
6. Model No. : *
7. Rating : ASME CL. 3000 Spl.
8. Total Qty Required : 1 Nos

BODY:

9. Type : Thru ☑ 3 Way ☐ Z type ☐ Angle ☐ ☐
10. Form : Globe ☑ Ball ☐ Butterfly ☐ ☐
11. Size : *
12. Port Size : * (bidder to match size of control valve with given 'd1' values)
13. Connecting Pipe size /EP
    Steam Inlet : OD 219.1 x 36(P22)
    Steam Outlet : ID 260 x 51(P22)
14. Body rating : ASME CL. 3000 Spl.
16. Bonnet type : Standard ☐ Finned ☑ Extended ☑ Pr. seal ☐ ☐
17. Material : Body : ASTM A 182 Gr F22
    Packing: GRAFOIL
    Bolting : *
18. Flow direction : HORIZONTAL
19. Suitable matching pieces to match with pipe size specified shall be offered.

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

Edge Preparation as per BPS.

TRIM:

20. No. of ports : *
21. Type : Balanced ☑ Unbalanced ☐
22. Plug characteristics: ~~L/LV~~/EP ✓ / ~~MODIFIED EP~~
23. Guiding : Cage ☑ Port ☐ Top ☐ Bottom ☐
24. Stem material :
25. Plug material :
26. Seat material :
27. Disc material :
28. stem guide material :

    410/CoCr–A OR EQUIVALENT

29. Cage Material : F22 Ion Nitrided (or) Better

ACTUATOR:

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

REV	DATE	ALTERATION	PREPARED	APPROVED	APPROVED
00	21.03.12	FRESH ISSUE	SUKUMAR	R.PRABHA	C.V.NATHAN

DRG. NO: 4–00–306–39886 REV 00

POSITIONER:

38. Type : Pneumatic ☐ Electronic ☐

DA/RA — Electro Pneumatic ☑ (SMART,HART communication)

39. If Electronic : Type : (with 4–20mA analog feedback signal)

Model : Solid plate deversing contactors

Main contactor : Solid state thyristor: ☐

Relay Switching : ☐

Also refer annexure – II

position indicator reqd. for Valve & VCB

40. If Pneumatic : Type : *

Model : *

Split range : Yes ☐ No ☑

Controller Input & Output Signal Value : 4–20 mA

Air supply : 45 PSIG

Input/Output Pr. guage :

Required : Yes ☑ No ☐

By pass provision : Yes ☐ No ☑

Action : Direct ☐ Reverse ☐ Both ☑

Cam : =% ☐ Linear ☐ Both ☑

ACCESSORIES:

41. Handwheel : Yes ☑ Side ☑ Top ☐

42. Air filter : Yes ☑ No ☐

Filter Size : 5 Micron ☑ 25 Micron ☐

43. Limit Switches : Yes ☑ No ☐

Qty. : 1 at full open &
: 1 at full close

Rating : 240v. 5Amp. ac

No of contacts per switch : 2No + 2NC

44. Solenoid valve to effect

Stayput : Yes ☑ No ☐

Type : 3 Way universal : Yes ☑ No ☐

Rating : 24V DC 2 wire

Class H coil : Yes ☑ No ☐

45. Vol. booster : Yes ☐ No ☑

46. Travel time : < 10 sec

47. Installation : Indoor ☐ Outdoor ☑

48. All accessories enclosure : *

49. Position transmitter : Yes ☐ No ☑

Type : Pnuematic : ☐ Electronic Non contact type ☑

Rating : 2 wire 24V DC: ☑ ☐

Output : 4–20 ma : ☑ 3–15 paig ☐

50. Torque Switches : Yes ☐ No ☑

Qty. :

Rating :

51. Air lock : Yes ☑ No ☐

Function : TO EFFECT STAYPUT

Type * : 3 Way single acting ☐

: 3 Way double acting ☐

52. Ambience : Dusty corrosive ☑

Toxic hazardous : ☐ ☐

53. Smart positioner : To suit HART protocol

53.1. Local position Indicator : Required.

53.2 Integral JB : 36 Way JB required
(2no. 9pin plug & socket connection)
(1no. 5pin plug & socket connection)

MISCELLANEOUS:

54. Seat leakage : ASME FCI/RP 70.2 ☑ CLASS IV

I.S.A : ☐ ☐

55. Approx. weight (total) : *

56. Space requirements for online servicing : *

57. Valve sizing as per ISA 75.01 : Yes ☑ No ☐

58. Noise Level : Less than 85 DBA at 1m from Valve & Piping System.

59. Intertubing Diagram : As per Enclosed.

60. Performance Data

Linearity : ± 1 % Hyterisis : ± 0.5 %

Sensitivity : ± 0.5 % Accuracy (overall) : ± 2 %

VALVE SIZING DATA:

61. Medium : SH Steam ☑ Sat. Steam ☐

Water ☐ ☐

62. Flow rate in T/Hr

63. Operating inlet pressure in Kg/cm^2 (a)

64. Operating inlet temperature in °C

65. Outlet pressure in Kg/cm^2 (a)

66. Viscosity : --

67. Operating (required) Cv

68. Operating noise level at 1.0 metre

69. Outlet velocity

CONDITION				
1	2	3	4	5
REFER DRAWING No. 4–00–306–39703 sht 6 of 12 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all	conditions)	

DATE	PREPARED	APPROVED	APPROVED
21.03.12	SUKUMAR	R.PRABHA	C.V.NATHAN

DRG. NO: 4–00–306–39886 REV 00

DESIGN DATA:

70. Design Pressure Kg/cm^2(g) 167.1
71. Design Temperature °C : 545
72. Rated/Design/Selected Cv of valve :
73. Velocity restriction :*
74. 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 Valve

TESTING/INSPECTION:

79. Hydraulic test report : Yes ☑ No ☐
80. Radiography : Critical Parts : ☑ Total ☐
Not required : ☐ ☐
81. IBR test report : Reqd. : ☑ ☐
82. Type test : Capacity Evoluation by ISA S39.2/5 39.4 : Required
83. Valve functional test : Yes ☑ No ☐
84. Accessories functional : Yes ☑ No ☐
Test :
85. Seat leakage test : Yes ☑ No ☐
86. Material test report : Yes ☑ No ☐
87. Customer Inspection :
In process : Yes ☑ No ☐
Final : Yes ☑ No ☐
88. Third Party inspection : Yes ☐ No ☐

DOCUMENTATION: (Required)

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

SPARES:

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

OTHERS:

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

NOTES:

1. * DENOTES BIDDER TO SPECIFY
2. **VIDEO MANUAL PREFERRED.

DATE	PREPARED	APPROVED	APPROVED	DRG. NO:	REV
21.03.12	SUKUMAR	R.PRABHA	C.V.NATHAN	4–00–306–39886	00

SIZING DATA FOR HIGH CAPACITY PRESSURE REDUCING VALVE

SL.NO.	PARAMETERS	CONDITION-1 (15% LOAD), (COLD START) (Case-I)	CONDITION-2 (30% LOAD) (HOT/ COLD) (Cases -3 & 4)	CONDITION-3 (100 % + SECOND UNIT START-UP REQT. + INTERMITTENT REQT.) (Case-8)	CONDITION-4 15 % LOAD, (HOT START) (Case- 2)	CONDITION-5 UP TO 40%LOAD (Case-5)	MECH. DESIGN PARAMETERS
1.0	INLET OF AUX. PRDS (INLET OF PRV)						
1.1	PRESSURE (kg/cm^2 (a))	38	82/46	150.00	82.00	64.00	167.1
1.2	TEMPERATURE (^OC)	395	495/430	537.0	440.0	450.0	545.0
1.3	FLOW (T/Hr)	74.21	85.88/97.32	123.06	84.12	69.62	
2.0	OUTLET OF AUX. PRDS (AFTER DESUPERHEATING)						
2.1	PRESSURE (kg/cm^2 (a))	16.0	16.0	16.0	16.0	16.0	21.0

1. CONDITION 1 IS THE CAPABILITY CHECK POINT

BRBCL & NTPC LTD
NABINAGAR THERMAL POWER PROJECT (4x250 MW)

H.C. DESUPERHEATER SPECIFICATION SHEET

01.	Designation/Tag No	: 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 (Steam side)	: ø323.9 x 9.53 , STYLE= 'D', d1=304.8 : 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
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 4-00-306-39703 sht 08 of 12
13 .	Design Pressure	: 21 Kg / cm^2 (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, 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 O & M manual. — 20 sets plus 3 sets of CD's

20.03.12	SUKUMAR	R.PRABHA	C.V.NATHAN	DRG. NO: 4-00-306-39891	REV 00
DATE	PREPARED	APPROVED	APPROVED		

SIZING DATA FOR HIGH CAPACITY DESUPERHEATER

SL.NO.	PARAMETERS	CONDITION-1 (15% LOAD) (Case-1)	CONDITION-2 (30% LOAD) (HOT/ COLD) (Cases -3 & 4)	CONDITION-3 (100 % + SECOND UNIT START-UP REQT. + INTERMITTENT REQT.) (Case-8)	CONDITION-4 15 % LOAD, (HOT START) (Case- 2)	CONDITION-5 UP TO 40%LOAD (Case-5)	MECH. DESIGN PARAMETERS
1.0	INLET OF DESUPERHEATER						
1.1	PRESSURE (kg/cm^2 a)	16	16/16	16	16	16	21.0
1.2	TEMPERATURE (^OC)	378.3	460.43 /410.31	474.5	396.5	420.4	485
1.3	FLOW (T/Hr)	74.21	85.88/97.32	123.06	84.12	69.62	
2.0	OUTLET OF DESUPERHEATER						
2.1	PRESSURE (kg/cm^2 a)	16	16/16	16	16	16	21
2.2	TEMPERATURE (^OC)	310	310	310	310	310	350
2.3	FLOW (T/Hr)	77.07	93.09/103.17	130.87	86.22	73.68	
3.0	INLET OF SPRAY CONTROL STATION (OUTLET OF COMMON BLOCK VALVE)						
3.1	PRESSURE (kg/cm^2 a)	24	24/24	21	24	21	30
3.2	TEMPERATURE (^OC)	46	46/46	49	46	49	55
3.3	FLOW (T/Hr)	2.85	7.22/5.84	7.81	2.10	4.06	

NOTES 1.High capacity PRDS shall have one reducing valve and desuperheater separately.
2. Spray control system shall be sized for 30kg/cm2

CI 12/A

CONTROL VALVE SPECIFICATION SHEET

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

PROJECT:
BRBCL & NTPC LTD
NABINAGAR TPP (4x250 MW)

CUST.No: 6979,6980,6981&6982.

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION PC: TSP: NABI:003,004 &005

1. Valve tag No. : AS–19
2. Service : Low capacity Pressure Control valve
3. Line No./Vessel No. :
4. Qty. required : ONE
5. Manufacturer : *
6. Model No. : *
7. Rating : ASME CL. 600
8. Total Qty Required : 1 No

BODY:

9. Type : Thru ☑ 3 Way ☐ Z type ☐ Angle ☐ ☐
10. Form : Globe ☑ Ball ☐ Butterfly ☐ ☐
11. Size : *
12. Port Size : * (Bidder to match size of control valve with given 'd1' values)
13. Connecting pipe size
    Inlet : OD 114.3x6.02
    Outlet : OD 168.3 x 7.11
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 ☑ BSPT ☐ ☐ DIN ☐ SW ☐ BS ☐ ☐

Edge Preparation as per BPS.

TRIM:

20. No. of ports : *
21. Type : Balanced ☑ Unbalanced ☑
22. Plug characteristics: ~~L/LV~~/EP / ~~MODIFIED EP~~
23. Guiding : Cage ☑ Port ☐ Top ☐ Bottom ☐
24. Stem material :
25. Plug material :
26. Seat material :
27. Disc material :
28. stem guide material :

17.4 PH SST / SS 316 OR EQUIVALENT

29. --

ACTUATOR:

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

REV	DATE	ALTERATION	PREPARED	APPROVED	APPROVED
00	20.03.12	FRESH ISSUE	SUKUMAR	R.PRABHA	C.V.NATHAN

DRG. NO: 4–00–306–39888 REV 00

POSITIONER:

38. Type : Pneumatic ☐ Electronic ☐
DA/RA Electro Pneumatic ☑
(SMART,HART communication)
39. If Electronic : Type : (with 4–20mA analog feedback signal)
Model : Solid plate deversing contactors
Main contactor : Solid state thyristor: ☐
Relay Switching : ☐
Also refer annexure – II
position indicator reqd. for Valve & VCB

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

ACCESSORIES:

41. Handwheel : Yes ☑ Side ☑ Top ☐
42. Air filter : Yes ☑ No ☐
Filter Size : 5 Micron ☑ 25 Micron ☐
43. Limit Switches : Yes ☑ No ☐
Qty. : 1 at full open &
: 1 at full close
Rating : 240v. 5Amp. ac
No of contacts per switch : 2No + 2NC
44. Solenoid valve to effect
Stayput : Yes ☑ No ☐
Type : 3 Way universal : Yes ☑ No ☐
Rating : 24V DC 2 wire
Class H coil : Yes ☑ No ☐
45. Vol. booster : Yes ☐ No ☑
46. Travel time : <10 SEC
47. Installation : Indoor ☐ Outdoor ☑
48. All accessories enclosure : *

49. Position transmitter : Yes ☐ No ☑
Type : Pnuematic : ☐ Electronic Non contact type ☑
Rating : 2 wire 24V DC: ☑ ☐
Output : 4–20 ma : ☑ 3–15 paig ☐
50. Torque Switches : Yes ☐ No ☑
Qty. :
Rating :
51. Air lock : Yes ☑ No ☐
Function : TO EFFECT STAYPUT
Type * : 3 Way single acting ☐
: 3 Way double acting ☐
52. Ambience : Dusty corrosive ☑
Toxic hazardous : ☐ ☐
53. Smart positioner : To suit HART protocol
53.1. Local position Indicator : Required.
53.2 Integral JB : 36 Way JB required
(2no. 9pin plug & socket connection)
(1no. 5pin plug & socket connection)

MISCELLANEOUS:

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

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

VALVE SIZING DATA:

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

CONDITION				
1	2	3	4	5
REFER DRAWING No. 4–00–306–39703 OF SHT 7 OF 12 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all	conditions)	

DATE	PREPARED	APPROVED	APPROVED	DRG. NO:	REV
20.03.12	SUKUMAR	R.PRABHA	C.V.NATHAN	4–00–306–39888	00

DESIGN DATA:

70. Design Pressure $Kg/cm^2(g)$: 48 Kg/Cm^2 (g)
71. Design Temperature °C : 365 °C
72. Rated/Design/Selected Cv of valve : *
73. Velocity restriction : *
74. 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 Valve

TESTING/INSPECTION:

79. Hydraulic test report : Yes ☑ No ☐
80. Radiography : Critical Parts : ☑ Total ☐
Not required : ☐ ☐
81. IBR test report : Reqd. : ☑ ☐
82. Type test : Capacity Evoluation by ISA S39.2/5 39.4 : Required.
83. Valve functional test : Yes ☑ No ☐
84. Accessories functional : Yes ☑ No ☐
Test :
85. Seat leakage test : Yes ☑ No ☐
86. Material test report : Yes ☑ No ☐
87. Customer Inspection :
In process : Yes ☑ No ☐
Final : Yes ☑ No ☐
88. Third Party inspection : Yes ☐ No ☐

DOCUMENTATION: (Required)

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

SPARES:

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

OTHERS:

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

NOTES:

1. * DENOTES BIDDER TO SPECIFY
2. ** VIDEO MANUAL PREFERRED.

20.03.12	SUKUMAR	R.PRABHA	C.V.NATHAN	DRG. NO: 4-00-306-39888	REV 00
DATE	PREPARED	APPROVED	APPROVED		

BHEL	AUXILIARY PRDS SIZING CALCULATION					DOC. NO.: 4-00-306-39703
	PROJECT TITLE : NABINAGAR TPP (4 X 250 MW)					SHEET NO. 7 OF 12
	SIZING DATA FOR LOW CAPACITY PRESSURE REDUCING VALVE					
	SL.NO.	PARAMETERS	CONDITION-1 (Case-6) NR AT 40% LOAD	CONDITION-2 (Case-6) NR AT 100% LOAD	CONDITION-3 (Case-7) NR + Intermittent Requirements	MECH. DESIGN PARAMETERS
	1.0	INLET OF PRV				
	1.1	PRESSURE (kg/cm^2 a)	17.58	41.37	41.37	48.0
	1.2	TEMPERATURE (^OC)	317.9	343.7	343.7	365.0
	1.3	FLOW (T/Hr)	34.10	34.05	38.79	
	2.0	OUTLET OF PRV				
	2.1	PRESSURE (kg/cm^2 a)	16.00	16.0	16.00	21.0

NOTES :-

1. VALVE SELECTED SHALL BE SUITABLE FOR PASSING 39 T/H AT RATED PARAMETERS.
2. CONDITION 3 IS THE CAPABILITY CHECK POINT

BRBCL & NTPC LTD

NABINAGAR THERMAL POWER PROJECT

L.T. DESUPERHEATER SPECIFICATION SHEET

01.	Designation/Tag No	: Auxiliary steam line / DESH – 02
02.	Quantity Required	: One
03.	Turndown ratio	: Bidder to specify
04.	Material	: ASTM A 106 Gr B
05.	Inlet connection/Outlet connection (Steam side)	: ø273 x 6.35 , STYLE= 'D' d1=260.3 : ø273 x 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.4–00–306–39703 sht 09 of 12
13 .	Design Pressure	: 21 Kg / cm^2 (g)
14.	Design Temperature	: 350 °C
15.	Minimum distance required in D/S of DESH for temp. control sensing element	: BIDDER TO SPECIFY
16.	Minimum distance required in D/S of DESH for pressure control sensing element	: BIDDER TO SPECIFY
17.	IBR Certification required	: Yes
18.	Testing/Inspection	: As per purchaser approved vendor QP

19. Documents required during offer :

Catalogues, filled up data sheets, Sizing calculations, Turn down 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 O & M manual. } 20 sets plus 3 sets of CD's

20.03.12	SUKUMAR	R.PRABHA	C.V.NATHAN	DRG. NO: 4–00–306–39892	REV 00
DATE	PREPARED	APPROVED	APPROVED		

BHEL		AUXILIARY PRDS SIZING CALCULATION					DOC. NO.: 4-00-306-39703					
		PROJECT TITLE : NABINAGAR TPP (4 X 250 MW)					SHEET NO. 9 OF 12					
	SIZING DATA FOR DESUPERHEATER BETWEEN HIGH & LOW TEMP. AUX. STEAM HEADER											
	SL.NO.		CONDITION-1 (CASE-1)	CONDITION-2 (CASE-6)	CONDITION-3 (CASE-6)	CONDITION-4 (CASE-8)	CONDITION-5 (CASE-2)	CONDITION-6 (CASE-3)	CONDITION-7 (CASE-4)	CONDITION-8 (CASE-5)	CONDITION-9 (CASE-7)	
		PARAMETERS	15% LOAD (COLD START)	NORMAL REQT. 40%	NORMAL REQT. 100%	(100 % + SECOND UNIT START-UP REQT. + INTERMITTENT REQT.)	15% LOAD (HOT START)	UP TO 30% COLD START UP	UP TO 30% HOT START UP	UP TO 40%	NORMAL REQT+INTERMITTENT REQ	MECH. DESIGN PARAMETERS
	1.0	INLET OF DESUPERHEATER										
	1.1	PRESSURE (kg/cm^2 a)	16	16	16	16	16	16	16	16	16	21
	1.2	TEMPERATURE (^OC)	310	310	310	310	310	310	310	310	310	350
	1.3	FLOW (T/Hr)	68.77	29.70	29.65	118.17	77.92	84.8	94.9	61.0	30.2	
	2.0	OUTLET OF DESUPERHEATER										
	2.1	PRESSURE (kg/cm^2 a)	16	16	16	16	16	16	16	16	16	21
	2.2	TEMPERATURE (^OC)	210	210	210	210	210	210	210	210	210	250
	2.3	FLOW (T/Hr)	75.10	32.60	32.60	129.1	85.1	92.6	104.0	66.6	33.2	
	3.0	INLET OF SPRAY CONTROL STATION										
		(OUTLET OF COMMON BLOCK VALVE)										
	3.1	PRESSURE (kg/cm^2 a)	24	21	21	21	24	24	24	24	21	30
	3.2	TEMPERATURE (^OC)	46	49	49	49	46	46	46	46	49	55
	3.3	FLOW (T/Hr)	6.33	2.90	2.95	10.93	7.17	7.8	8.7	5.6	3.0	
	Note:1. Spray control systems shall be sized for 30 kg/cm2											

CI 12/A

CONTROL VALVE SPECIFICATION SHEET

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

PROJECT:
BRBCL & NTPC LTD
NABINAGAR TPP (4x250 MW)

CUST.No: 6979,6980,6981&6982.

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION PC: TSP: NABI:003,004 &005

1. Valve tag No. : CD-15
2. Service : SPRAY WATER COMMON BLOCK VALVE.
3. Line No./Vessel No. :
4. Qty. required per unit : ONE
5. Manufacturer : *
6. Model No. : *
7. Rating : ASME CL.800
8. Total Qty Required : 1 No

BODY:

9. Type : Thru ☑ 3 Way ☐ Z type ☐ Angle ☐ ☐
10. Form : Globe ☑ Ball ☐ Butterfly ☐ ☐
11. Size : *
12. Port Size : *
13. Connecting pipe size : Inlet : OD 60.3 x 5.54 Outlet : OD 60.3 x 5.54
14. Body rating : ASME CL.800
16. Bonnet type : Standard ☑ Finned ☐ Extended ☑ Pr. seal ☐ ☐
17. Material : Body : SA105 Packing: GRAFOIL Bolting : *
18. Flow direction : HORIZONTAL
19. Suitable matching pieces to match with pipe size specified shall be offered.

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

Edge Preparation as per BPS.

TRIM:

20. No. of ports : *
21. Type : Balanced ☑ Unbalanced ☐
22. Plug characteristics: QUICK OPENING
23. Guiding : Cage ☑ Port ☐ Top ☐ Bottom ☐
24. Stem material : 316 SST Strain Hardened
25. Plug material :
26. Seat material :
27. Disc material :
28. stem guide material : } 17.4 PH SST/416C SST OR EQUIVALENT
29. --

ACTUATOR:

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

REV	DATE	ALTERATION	PREPARED	APPD./C&I	APPROVED
00	20.03.12	FRESH ISSUE	SUKUMAR	R.PRABHA	C V N

DRG. NO: 4-00-306-39893 REV 00

POSITIONER: NOT REQUIRED

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

39. If Electronic : Type :
Model : Solid plate deversing contactors
Main contactor : Solid state thyristor: ☐
Relay Switching : ☐
Also refer annexure – II
position indicator reqd. for Valve & VCB

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

ACCESSORIES:

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

44. Solenoid valve as pilot device
Stayput : Yes ☐ No ☐
Type : 4 Way Dual coil Universal: Yes ☑ No ☐
Rating : 24V DC 2 wire
Class H coil : Yes ☑ No ☐
45. Vol. booster : Yes ☐ No ☑
46. Travel time : < 10 Sec.
47. Installation : Indoor ☐ Outdoor ☑
48. All accessories enclosure : *

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

MISCELLANEOUS:

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

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

VALVE SIZING DATA:

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

CONDITION				
1	2	3	4	5
REFER DRAWING No. 4–00–306–39703 SHT 12 OF 12 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all conditions)		

DATE	PREPARED	APPD./C&I	APPROVED
20.03.12	SUKUMAR	R.PRABHA	C V N

DRG. NO: 4–00–306–39893 REV 00

DESIGN DATA:

70. Design Pressure Kg/cm^2(g) : 30 Kg/Cm ^{2}(g)
71. Design Temperature °C : 55°C
72. Rated/Design/Selected Cv of valve : *
73. Velocity restriction : *
74. 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 Valve

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

79. Hydraulic test report : Yes ☑ No ☐
80. Radiography : Critical Parts : ☑ Total ☐
Not required : ☐ ☐
81. IBR test report : Reqd. : ☑ ☐
82. Type test : Capacity Evoluation by *
ISA S39.2/5 39.4 : Required.
83. Valve functional test : Yes ☑ No ☐

* Type test to be done atleast for one no on this consignment.

84. Accessories functional : Yes ☑ No ☐
Test :
85. Seat leakage test : Yes ☑ No ☐
86. Material test report : Yes ☑ No ☐
87. Customer Inspection :
In process : Yes ☑ No ☐
Final : Yes ☑ No ☐
88. Third Party inspection : Yes ☐ No ☐

DOCUMENTATION: (Required)

89. With bid. (3 sets)
Catalogues : Yes ☑ No ☐
Dimensional drawing : Yes ☑ No ☐
All data sheets : Yes ☑ No ☐
Recommendation / Limitation : Yes ☑ No ☐
Confirmatory report : Yes ☑ No ☐
Contrary report : Yes ☑ No ☐
Deviation report : Yes ☑ No ☐
90. Quality plan : Yes ☑ No ☐

91. With equipment :
Dimensional drawing : 15 Sets
O & M ** : --do--
Data Sheets : --do--
Test certificate : 1RTF + 3 Sets
92. Valve sizing, actuator sizing, noise level calculations required with bid(with formulae) : Yes ☑ No ☐
93. --

SPARES:

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

OTHERS:

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

NOTES:

1. * DENOTES BIDDER TO SPECIFY
2. ** VIDEO MANUAL PREFERRED.

20.03.12	SUKUMAR	R.PRABHA	C V N	DRG. NO: 4-00-306-39893	REV 00
DATE	PREPARED	APPD./C&I	APPROVED		

BHEL		AUXILIARY PRDS SIZING CALCULATION					DOC. NO.: 4-00-306-39703						
		PROJECT TITLE : NABINAGAR TPP (4 X 250 MW)					SHEET NO. 12 OF 12						
		SIZING DATA FOR COMMON BLOCK VALVE CD-15(BLOCK VALVE)											
	SL.NO.		CONDITION-1 (CASE-1)	CONDITION-2 (CASE-6)	CONDITION-3 (CASE-6)	CONDITION-4 (CASE-8)	CONDITION-5 (CASE-2)	CONDITION-6 (CASE-3)	CONDITION-7 (CASE-4)	CONDITION-8 (CASE-5)	CONDITION-9 (CASE-7)		
		PARAMETERS	15% LOAD (COLD START)	NORMAL REQT. 40%	NORMAL REQT. 100%	(100 % + SECOND UNIT START-UP REQT. + INTERMITTENT REQT.)	15% LOAD (HOT START)	UP TO 30% COLD START UP	UP TO 30% HOT START UP	UP TO 40%	NORMAL REQT+INTERMITTENT REQ	MECH. DESIGN PARAMETERS	
	1.0	INLET OF VALVE											
	1.1	PRESSURE (kg/cm^2 a)	26	23	23	23	26	26	26	26	23	30	
	1.2	TEMPERATURE (^OC)	46	49	49	49	46	46	46	46	49	55	
	1.3	OUTLET OF SPRAY CONTROL STATION											
	2.0												
	2.1	PRESSURE (kg/cm^2 a)	25	22	22	22	25	25	25	25	22	30	
	2.2	TEMPERATURE (^OC)	46	49	49	49	46	46	46	46	49	55	
	2.3	FLOW (T/Hr)	9.18	2.90	2.95	18.74	9.30	15.02	14.54	9.66	3.00		

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

CI 12/A

CONTROL VALVE SPECIFICATION SHEET

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

PROJECT:
BRBCL & NTPC LTD
NABINAGAR TPP (4x250 MW)

CUST.No: 6979,6980,6981&6982.

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION PC: TSP: NABI:003,004 &005

1. Valve tag No. : CD-08 & CD-11
2. Service : LOW CAPACITY SPRAY CONTROL VALVE
3. Line No./Vessel No. : —
4. Qty. required : ONE
5. Manufacturer : *
6. Model No. : *
7. Rating : ASME CL. 800
8. Total Qty Required : 1 No

BODY:

9. Type : Thru ☑ 3 Way ☐ Z type ☐ Angle ☐
10. Form : Globe ☑ Ball ☐ Butterfly ☐
11. Size : *
12. Port Size : *
    (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
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 ☐ BW ☐ SW ☑ NPI ☐ BSPT ☐ BS ☐ Flanged ☐ ANSI ☐ DIN ☐

Edge Preparation as per BPS.

TRIM: MULTI STAGE.

20. No. of ports : *
21. Type : Balanced ☑ Unbalanced ☐
22. Plug characteristics: ~~L/LV~~/EP / ~~MODIFIED EP~~
23. Guiding : Cage ☑ Port ☐ Top ☐ Bottom ☐
24. Stem material : 316 SST Strain Hardened
25. Plug material :
26. Seat material :
27. Disc material :
28. stem guide material : } 17.4 PH SST/ 440C SST OR EQUIVALENT
29. --

ACTUATOR:

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

REV	DATE	ALTERATION	PREPARED	APPROVED	APPROVED
00	20.03.12	FRESH ISSUE	SUKUMAR	R.PRABHA	C.V.NATHAN

DRG. NO: 4-00-306-39890 REV 00

POSITIONER:

38. Type : Pneumatic ☐ Electronic ☐
DA/RA Electro Pneumatic ☑
(SMART,HART communication)
(with 4–20mA analog feedback signal)

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

Main contactor : Solid state thyristor: ☐
Relay Switching : ☐

Also refer annexure – II

position indicator reqd. for Valve & VCB

40. If Pneumatic : Type : *
Model : *

Split range : Yes ☐ No ☑
Controller Input & Output Signal Value : 4–20 mA
Air supply : 45 PSIG
Input/Output Pr. guage :
Required : Yes ☑ No ☐
By pass provision : Yes ☐ No ☑
Action : Direct ☐ Reverse ☐ Both ☑
Cam : =% ☐ Linear ☐ Both ☑

ACCESSORIES:

41. Handwheel : Yes ☑ Side ☑ Top ☐
42. Air filter : Yes ☑ No ☐
Filter Size : 5 Micron ☑ 25 Micron ☐
43. Limit Switches : Yes ☑ No ☐
Qty. : 1 at full open &
: 1 at full close
Rating : 240v. 5Amp. ac
No of contacts per switch : 2No + 2NC
44. Solenoid valve to effect
Stayput : Yes ☑ No ☐
Type : 3 Way universal : Yes ☑ No ☐
Rating : 24V DC 2 wire
Class H coil : Yes ☑ No ☐
45. Vol. booster : Yes ☐ No ☑
46. Travel time : < 10 sec
47. Installation : Indoor ☐ Outdoor ☑
48. All accessories enclosure : *

49. Position transmitter : Yes ☐ No ☑
Type : Pnuematic : ☐ Electronic Non contact type ☑
Rating : 2 wire 24V DC: ☑ ☐
Output : 4–20 ma : ☑ 3–15 paig ☐
50. Torque Switches : Yes ☐ No ☑
Qty. :
Rating :
51. Air lock : Yes ☑ No ☐
Function : TO EFFECT STAYPUT
Type : 3 Way single acting ☐
: 3 Way double acting ☐
52. Ambience : Dusty corrosive ☑
Toxic hazardous : ☐ ☐
53. Smart positioner : To suit HART protocol
53.1. Local position Indicator : Required.
53.2 Integral JB : 36 Way JB required
(2no. 9pin plug & socket connection)
(1no. 5pin plug & socket connection)

MISCELLANEOUS:

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

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

VALVE SIZING DATA:

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

CONDITION				
1	2	3	4	5
REFER DRAWING No. 4–00–306–39703 sht 11 of 12 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all	conditions)	

DATE	PREPARED	APPROVED	APPROVED	DRG. NO:	REV
20.03.12	SUKUMAR	R.PRABHA	C.V.NATHAN	4–00–306–39890	00

DESIGN DATA:

70. Design Pressure Kg/cm^2(g) : 30 Kg/Cm ^{2}(g)
71. Design Temperature °C : 55 °C
72. Rated/Design/Selected Cv of valve : *
73. Velocity restriction : *
74. 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 Valve

TESTING/INSPECTION:

79. Hydraulic test report : Yes ☑ No ☐
80. Radiography : Critical Parts : ☑ Total ☐
Not required : ☐ ☐
81. IBR test report : Reqd. : ☑ ☐
82. Type test : Capacity Evoluation by ISA S39.2/5 39.4 : Required.
83. Valve functional test : Yes ☑ No ☐
84. Accessories functional Test : Yes ☑ No ☐
85. Seat leakage test : Yes ☑ No ☐
86. Material test report : Yes ☑ No ☐
87. Customer Inspection :
In process : Yes ☑ No ☐
Final : Yes ☑ No ☐
88. Third Party inspection : Yes ☐ No ☐

DOCUMENTATION: (Required)

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

SPARES:

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

OTHERS:

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

NOTES:

1. * DENOTES BIDDER TO SPECIFY
2. **VIDEO MANUAL PREFERRED.

20.03.12	SUKUMAR	R,PRABHA	C.V.NATHAN	DRG. NO: 4-00-306-39890	REV 00
DATE	PREPARED	APPROVED	APPROVED		

BHEL		AUXILIARY PRDS SIZING CALCULATION					DOC. NO.: 4-00-306-39703					
		PROJECT TITLE : NABINAGAR TPP (4 X 250 MW)					SHEET NO. 11 OF 12					
		SIZING DATA FOR LOW TEMP SPRAY CONTROL VALVE CD-08,CD-11										
	SL.NO.		CONDITION-1 (CASE-1)	CONDITION-2 (CASE-6)	CONDITION-3 (CASE-6)	CONDITION-4 (CASE-8)	CONDITION-5 (CASE-2)	CONDITION-6 (CASE-3)	CONDITION-7 (CASE-4)	CONDITION-8 (CASE-5)	CONDITION-9 (CASE-7)	
		PARAMETERS	15% LOAD (COLD START)	NORMAL REQT. 40%	NORMAL REQT. 100%	(100 % + SECOND UNIT START-UP REQT. + INTERMITTENT REQT.)	15% LOAD (HOT START)	UP TO 30% COLD START UP	UP TO 30% HOT START UP	UP TO 40%	NORMAL REQT+INTER MITTENT REQ	MECH. DESIGN PARAMETERS
	1.0	INLET OF VALVE										
	1.1	PRESSURE (kg/cm^2 a)	25	22	22	22	25	25	25	25	22	30
	1.2	TEMPERATURE (^OC)	46	49	49	49	46	46	46	46	49	55
	1.3	OUTLET OF SPRAY CONTROL STATION										
	2.0											
	2.1	PRESSURE (kg/cm^2 a)	24	21	21	21	24	24	24	24	21	30
	2.2	TEMPERATURE (^OC)	46	49	49	49	46	46	46	46	49	55
	2.3	FLOW (T/Hr)	6.33	2.90	2.95	10.93	7.2	7.8	8.7	5.6	3.0	

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

CI 12/A

CONTROL VALVE SPECIFICATION SHEET

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

PROJECT:
BRBCL & NTPC LTD
NABINAGAR TPP (4x250 MW)

CUST.No: 6979,6980,6981&6982.

GENERAL:THIS IS TO BE READ ALONG WITH TECHNICAL SPECIFICATION PC: TSP: NABI:003,004 &005

1. Valve tag No. : CD-02 & CD-04
2. Service : HIGH capacity Spray Control valve
3. Line No./Vessel No. :
4. Qty. required : ONE
5. Manufacturer : *
6. Model No. : *
7. Rating : ASME Cl 800
8. Total Qty Required : 1 No

BODY:

9. Type : Thru ☑ 3 Way ☐ Z type ☐ Angle ☐ ☐
10. Form : Globe ☑ Ball ☐ Butterfly ☐ ☐
11. Size : *
12. Port Size : *
    (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 Cl 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 ☐ BW ☐ SW ☑
    NPI ☐ BSPT ☐ BS ☐
    Flanged ☐ ☐ ☐
    ANSI ☐ DIN ☐

Edge Preparation as per BPS.

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 :

    17.4 PH SS / SS 316 OR EQUIVALENT

29. --

ACTUATOR:

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

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POSITIONER:

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

39. If Electronic : Type :
(with 4–20mA analog feedback signal)
Model : Solid plate deversing contactors

Main contactor : Solid state thyristor: ☐
Relay Switching : ☐

Also refer annexure – II

position indicator reqd. for Valve & VCB

40. If Pneumatic : Type : *
Model : *

Split range : Yes ☐ No ☐
Controller Input & Output Signal Value : 4–20 mA
Air supply : 45 PSIG
Input/Output Pr. guage :
Required : Yes ☑ No ☐
By pass provision : Yes ☐ No ☑
Action : Direct ☐ Reverse ☐ Both ☑
Cam : =% ☐ Linear ☐ Both ☑

ACCESSORIES:

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

44. Solenoid valve as Stayput : Yes ☑ No ☐
Type : 3 Way universal : Yes ☑ No ☐
Rating : 24V DC 2 wire
Class H coil : Yes ☑ No ☐
45. Vol. booster : Yes ☐ No ☑
46. Travel time : <10 sec
47. Installation : Indoor ☐ Outdoor ☑
48. All accessories enclosure : *

49. Position transmitter : Yes ☐ No ☑
Type : Pnuematic : ☐ Electronic Non contact type ☑
Rating : 2 wire 24V DC: ☑ ☐
Output : 4–20 ma : ☑ 3–15 paig ☐
50. Torque Switches : Yes ☐ No ☑
Qty. :
Rating :
51. Air lock : Yes ☑ No ☐
Function : TO EFFECT STAYPUT
Type * : 3 Way single acting ☐
: 3 Way double acting ☐
52. Ambience : Dusty corrosive ☑
Toxic hazardous : ☐ ☐
53. Smart positioner : To suit HART protocol
53.1. Local position Indicator : Required.
53.2 Integral JB : 36 Way JB required
(2no. 9pin plug & socket connection)
(1no. 5pin plug & socket connection)

MISCELLANEOUS:

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

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

VALVE SIZING DATA:

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

CONDITION				
1	2	3	4	5
REFER DRAWING No. 4-00-306-39703 sht 10 of 12 FOR VALVE SIZING DATA				

REFER STANDARD TABLE

<85	dba	(for all	conditions)	

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DESIGN DATA:

70. Design Pressure Kg/cm^2(g) : 30 Kg/Cm^2 (g)
71. Design Temperature °C : 55 °C
72. Rated/Design/Selected Cv of valve : *
73. Velocity restriction : *
74. 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 Valve

TESTING/INSPECTION:

79. Hydraulic test report : Yes ☑ No ☐
80. Radiography : Critical Parts : ☑ Total ☐
Not required : ☐ ☐
81. IBR test report : Reqd. : ☑ ☐
82. Type test : Capacity Evoluation by ISA S39.2/5 39.4 : Required.
83. Valve functional test : Yes ☑ No ☐
84. Accessories functional : Yes ☑ No ☐
Test :
85. Seat leakage test : Yes ☑ No ☐
86. Material test report : Yes ☑ No ☐
87. Customer Inspection :
In process : Yes ☑ No ☐
Final : Yes ☑ No ☐
88. Third Party inspection : Yes ☐ No ☐

DOCUMENTATION: (Required)

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

SPARES:

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

OTHERS:

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

NOTES:

1. * DENOTES BIDDER TO SPECIFY
2. ** VIDEO MANUAL PREFERRED.

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BHEL		AUXILIARY PRDS SIZING CALCULATION						DOC. NO.: 4-00-306-39703
		PROJECT TITLE : NABINAGAR TPP (4 X 250 MW)						SHEET NO. 10 OF 12
		SIZING DATA FOR HIGH TEMP SPRAY CONTROL VALVE CD-02,CD-04						
	SL.NO.		CONDITION-1	CONDITION-2	CONDITION-3	CONDITION-4	CONDITION-5	
		PARAMETERS	(15% LOAD) (Case-1)	(30% LOAD) (HOT/ COLD) (Cases -3 & 4)	(100 % + SECOND UNIT START-UP REQT. + INTERMITTENT REQT.) (Case-8)	15 % LOAD, (HOT START) (Case-2)	UP TO 40%LOAD (Case-5)	MECH. DESIGN PARAMETERS
	1.0	INLET OF VALVE						
	1.1	PRESSURE (kg/cm^2 a)	25	25/25	22	25	22	30
	1.2	TEMPERATURE (^OC)	46	46/46	49	46	49	55
	1.3	OUTLET OF SPRAY CONTROL STATION						
	2.0							
	2.1	PRESSURE (kg/cm^2 a)	24	24/24	21	24	21	30
	2.2	TEMPERATURE (^OC)	46	46/46	49	46	49	55
	2.3	FLOW (T/Hr)	2.85	7.22/5.84	7.81	2.10	4.06	

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