

THE SINGARENI COLLIRIES
COMPANY LIMITED

2X600 MW SCCL COAL BASE TPP

TECHNICAL SPECIFICATION
FOR
**AUXILIARY STEAM PRESSURE REDUCING
AND DESUPERHEATING STATION
ALONGWITH ACCESSORIES**

VOLUME - II B

SPECIFICATION No: PE-TS -381-142-N101 (REV 00)



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
PPEI, NOIDA, INDIA**



TITLE

PREAMBLE

SPECIFICATION NO **PE-SS-999-100-Q-001**

VOLUME **II B**

SECTION PREAMBLE

REV NO. **0** DATE 05.02.2008

SHEET 1 OF 1

1.0 Volume – II B :

This volume is sub- divided into following sections: -

Section – A : This section outlines the scope of enquiry

Section – B : This section provides : “ Project Information”.


Section- C : This section indicates tech. Requirements specific to the contract, not covered in Section – D.

Section – D : This section comprises of tech. Specifications of equipments complete with data sheet A,B&C.

Data Sheet – A specifics data and other requirements pertaining to the equipment.

Data sheet – B specifics data to be filled by the bidder (Data Sheet B is contained in Volume – III.

Data Sheet – C indicates data/ documents to be furnished after the award of contract as per agreed schedule by the vendor (as applicable).

	TITLE AUXILIARY STEAM PRESSURE REDUCING & DESUPERHEATING STATION SCCL – 2X600 MW SINGARENI	SPEC. NO.: PE-TS-381-142-N101	
		VOLUME II-B	
		SECTION	CONTENTS
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TITLE

**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION**

SCCL – 2X600 MW SINGARENI

SPEC. NO.: PE-TS-381-142-N101

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FILLED-UP QUALITY PLAN AS MINIMUM REQUIREMENTS IS INCLUDED
FOR CONTROL VALVE & STEAM DESUPERHEATER.



TITLE

SCOPE OF ENQUIRY
AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION
FOR
SCCL - 2x600 SINGARENI TPP

SPEC. NO.: PE-TS-381-142-N101

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SECTION **A**

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SECTION – A

SCOPE OF ENQUIRY

	TITLE SCOPE OF ENQUIRY AUXILIARY STEAM PRESSURE REDUCING & DESUPERHEATING STATION FOR SCCL - 2x600 SINGARENI TPP	SPEC. NO.: PE-TS-381-142-N101	
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1.1 This enquiry covers the Design, Manufacture, Assembly, Inspection and Testing at Vendor's and/or his sub-vendors works, painting and delivery to site of Auxiliary Steam Pressure Reducing & Desuperheating Stations, as mentioned in different sections of this specification for SCCL - 2x600 MW SINGARENI TPP.

The tenderer shall also quote for the following :-

- Supervision of erection & commissioning of the equipment.
- Recommended spares for 3 years of post guarantee period operation.

1.2 It is not the intent to specify herein all the details of design and manufacture. However, the equipment shall conform in all respects to high standards of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to the Engineer/Owner who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material, which in his judgment is not in full accordance herewith.

1.3 The bidder may quote for his standard, proven design of equipment and shall indicate any deviations from this specification in the enclosed schedule. In the absence of duly filled deviation schedule, it shall be presumed that the offer conforms exactly to this specification. The bidder shall also furnish the performance feedback data of the equipment from similar installations. However, the acceptance of the deviations/options is not binding on the Engineer/Owner.


1.4 The bids shall be in English language and MKS Units.

1.5 Filled up quality Plans as minimum technical requirements, are included in this specification in Vol. IIB Sec D. Bidder is required to submit the enclosed Quality Plan, or bring out specific deviations on it, while submitting the bid.

1.6 Similar to Quality Plan, Bidder is required to furnish Field Quality Plan (FQP). FQP shall indicate all inspection/test to be carried out at site covering the following:

- Receipt of material.
- Storage or Conservation.
- Pre-Erection & Erection
- Pre-Commissioning, commissioning & post commissioning.

FQP shall furnish adequate instructions to be followed by erection & commissioning agency at site.

	TITLE SCOPE OF ENQUIRY AUXILIARY STEAM PRESSURE REDUCING & DESUPERHEATING STATION FOR SCCL - 2x600 SINGARENI TPP	SPEC. NO.: PE-TS-381-142-N101	
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Bidder is requested to refer standard no PES-100-918 on field quality plan enclosed in Volume II-A of this specification.

- 1.7 The omission of specific reference to any component / accessory necessary for the proper performance of the equipments shall not relieve the supplier of the responsibility of providing such facilities to complete the supply within the quoted prices.
- 1.8 BHEL's / SCCL's representatives shall be given access to the shop in which the equipments are being manufactured or tested and all test records shall be made available to him.
- 1.9 The Equipment covered under this specification shall not be dispatched unless the same have been finally inspected, accepted and Material Dispatch Clearance Certificate (MDCC) is issued by BHEL / SCCL.



TITLE
**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION**
FOR
SCCL - 2x600 SINGARENI TPP

SPEC. NO.: PE-TS-381-142-N101

VOLUME **IIB**

SECTION **B**

REV NO. **0** DATE 25.07.2012

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SECTION – B
PROJECT INFORMATION

CLAUSE NO.	PROJECT INFORMATION			
<p>1.00.00</p> <p>BACKGROUND</p> <p>The Singarenis Collieries Company Limited is a government coal mining companies jointly owned by the Government of Andhra Pradesh and Government of India on a 51:49 equity basis</p> <p>The present proposal is for setting up of a coal based Singareni Thermal Power Project (2x600 MW) to be owned by The Singareni Collieries Company Limited, which is A Government Company.</p> <p>1.01.00</p> <p>LOCATION AND APPROACH</p> <p>The Singareni TPP is located near Pegadapalli village, Jaipur Mandal, District Adilabad of Andhra Pradesh. The latitude and longitude of Site are 18° 48' 30" to 18° 50' 35" and 79° 34' 00" to 79° 35' 30" respectively. The Site is 14.6 Km from nearest town Mancherial and 4.6 Km from State Highway. Distance from NH-16 (Nirmal-Chinnur section) is 500M.</p> <p>Nearest railway station is Mancherial railway station on Nagpur-Kazipet main rail line of South Central Railway, located at a distance of about 14.6 kms.</p> <p>Nearest airport is Shamshabad Airport, Hyderabad at a distance of about 250KM.</p> <p>Vicinity Plan of the project is placed at Annexure-I</p> <p>1.02.00</p> <p>LAND REQUIREMENT</p> <p>About 490 hectares of land has been identified for the plant, CHP, water reservoir, Staff colony, ash dump area, Coal conveyor corridors, water pipelines and Green belts.</p> <p>1.03.00</p> <p>WATER</p> <p>Water requirement has been assessed as 3700 cum/hr.</p> <p>Irrigation & CAD Deptt., Govt. of Andhra Pradesh has allocated 1.0 TMC of water per annum from Pranahita Chevella Lift Irrigation Scheme vide Memo No. 17556/Maj.Irr.VIII(1)/08 dated 02.07.2008 (Annexure-2.1).</p> <p>During the no-flow period in the river, Govt. of Andhra Pradesh, Ground Water Department vide their letter No. 157/T/2008 dated 07.08.2008 addressed to SCCL have accorded approval for drawal of 18 MGD (3409 cum/hr) water through infiltration galleries in River Godavari at Shetpally Village for the project.</p>				
<p>SINGARENI THERMAL POWER PROJECT (2X600 MW) BOILER TURBINE GENERATOR PACKAGE</p>	<p>TECHNICAL SPECIFICATION SECTION - VI PART-A</p>	<p>SUB-SECTION-I PROJECT INFORMATION</p>	<p>PAGE 2 OF 3</p>	

CLAUSE NO.	PROJECT INFORMATION		
	<p>SCCL has approached Govt. of Andhra Pradesh vide letter dated 29.08.09 to get allocation of 2 TMC of water from Sripada-Yellempalli Project including already allocated 1 TMC of water for the Power Project.</p> <p>Suitable intake system will be developed at a location as may be suggested by Ground Water Deptt., Govt. of Andhra Pradesh.</p>		
1.04.00	COAL AVAILABILITY AND TRANSPORTATION		
1.04.01	<p>Coal Availability</p> <p>Coal requirement for 1200 MW capacity has been assessed as 4.784 mtpa.</p> <p>Coal will be sourced mainly from Srirampur OCM of SCCL and nearby coalmines of SCCL.</p>		
1.04.02	<p>Coal Transportation</p> <p>Coal will be linked from Srirampur OCM & nearby coalmines of SCCL. (-) 200 mm size Coal will be transported by Rail / MGR system from mines to plant site</p> <p>As a standby arrangement coal shall also be transported by road and the arrangement shall be made in Plant CHP to receive the coal through trucks by designing suitable ground hopper.</p>		
1.04.03	<p>Coal Quality Parameters and Fuel Oil Characteristics</p> <p>The tentative Coal quality parameters and Fuel Oil Characteristics are enclosed as Annexures-II-1 and II-2 to this subsection.</p>		
1.05.00	<p>CAPACITY & POWER EVACUATION</p> <p>Power generated is proposed to be stepped upto 400 kV by generator transformer and will be evacuated through the double circuit overhead transmission system.</p>		
1.06.00	<p>METEOROLOGICAL DATA</p> <p>Important meteorological data from nearest observatory at Ramagundam is placed at Annexure - III.</p>		
1.07.00	<p>PLANT WATER SCHEME</p> <p>The Plant water scheme is described below.</p>		
<p>SINGARENI THERMAL POWER PROJECT (2X600 MW) BOILER TURBINE GENERATOR PACKAGE</p>	<p>TECHNICAL SPECIFICATION SECTION - VI PART-A</p>	<p>SUB-SECTION-I PROJECT INFORMATION</p>	<p>PAGE 3 OF 3</p>



TITLE
SPECIFIC TECHNICAL REQUIREMENTS

**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION
FOR
2x600 MW SCCL- SINGARENI TPP**

SPEC. NO. PE-TS-381-142-N101

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SPECIFIC TECHNICAL REQUIREMENTS

**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION
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1.0.0 BRIEF SYSTEM DESCRIPTION

1.1.0 Auxiliary steam system is designed to provide steam for the turbine auxiliaries, boiler auxiliaries and fuel oil heating system during start-up, low loads and normal running of unit.

1.2.0 The system comprises of two auxiliary steam pressure reducing and desuperheating stations (PRDS).

- (A) One "High capacity PRDS" with tapping off steam from main steam line
- (B) "Low Capacity PRDS" with tapping off steam from CRH line

1.3.0 These two stations will reduce the pressure and temperature of the steam tapped off from CRH line and main steam line to 16 kg/cm² (abs) & 310°C at the high temperature auxiliary steam header and subsequently to 16 kg/cm² (abs) & 210°C at the low temperature auxiliary steam header through a suitable desuperheater between the high temperature and low temperature auxiliary steam headers.

2.0.0 EQUIPMENT TO BE PROVIDED BY TENDERER (AUXILIARY STEAM PRDS COMPRISING OF):

2.1.0 Control Valves & Accessories:

- 2.0.1. Combined Type PRDS (ASV-22) on MS Line : One No. / Unit (02 nos for 2 units)
- 2.0.2. Low Capacity PRV on CRH Line (ASV-65) : One No. / Unit (02 nos for 2 units)
- 2.0.3. Spray Block Valve (FDV-51) : One No. / Unit (02 nos for 2 units)
- 2.0.4. Spray Pressure Control Valve for HC-PRDS (FDV-53) : One No. / Unit (02 nos for 2 units)
- 2.0.5. Spray Temp. Control Valve for HC-PRDS (FDV-54) : One No. / Unit (02 nos for 2 units)
- 2.0.6. Bypass to FDV-53 (FDV-58) : One No. / Unit (02 nos for 2 units)
- 2.0.7. Bypass to FDV-54 (FDV-59) : One No. / Unit (02 nos for 2 units)



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**AUXILIARY STEAM PRESSURE REDUCING
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- 2.0.8. Spray Pressure Control Valve for LT-DESH (FDV-62): One No. / Unit (02 nos for 2 units)
- 2.0.9. Spray Temp. Control Valve for LT-DESH (FDV-63) : One No. / Unit (02 nos for 2 units)
- 2.0.10. Bypass to FDV-62 (FDV-67) : One No. / Unit (02 nos for 2 units)
- 2.0.11. Bypass to FDV-63 (FDV-68) : One No. / Unit (02 nos for 2 units)

Each control valve shall be supplied with the accessories (i.e. Gasket, gland packing & Cu tubing) specified in the relevant data sheets at Section-D.


2.2.0 Desuperheaters :


- 2.0.12. Direct mixing type LT desuperheater (DESH-2) : One No. / Unit (02 nos for 2 units)


The desuperheater shall be complete with pipe, spray nozzle along with necessary attachment as specified in section-D. **Insertion type desuperheaters, desuperheater having moving part is steam zone are not acceptable.**


3.0.0 SPECIFIC TECHNICAL REQUIREMENTS FOR CONTROL VALVES & ACCESSORIES:-


The requirements in this section are specific for the project and shall over-ride the specification under section-D in case of any contradiction.


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 Sub-section 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	For control valve such as pressure and temperature control valve for Aux PRDS applications, Separator Drain Control Valves etc., also refer to the corresponding mechanical section in addition to requirements stipulated in this subsection.			
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.			
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.			
SINGARENI THERMAL POWER PROJECT (2X600 MW) BOILER TURBINE GENERATOR PACKAGE		TECHNICAL SPECIFICATION SECTION – VI PART-B	III-C-10 CONTROL VALVES, ACTUATORS & ACCESSORIES	PAGE 3 OF 15

CLAUSE NO.	TECHNICAL REQUIREMENTS			
2.00.00	VALVE ONSTRUCTION			
2.01.00	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. No.	Service	Body material	Trim Material
	1	Non-corrosive, non-flashing and non-cavitation service except DM water	Carbon steel ASTM-A216 Gr. WCB for fluid temperature below 275 Deg. C Alloy steel ASTM-A217Gr. WC9 for fluid temperature above 275 Deg. C	316SS stellited with stellited faced guide posts and bushings.
	2.	Severe flashing/cavitati on services	Alloy steel ASTM-A217 Gr. WC9	440 C
	3.	Low flashing/cavitati on service	Alloy steel ASTM-A217 Gr. WC6	17-4 PH SS
	4.	DM water service	316 SS	316 SS
	NOTE Valve body rating shall meet the process pressure and temperature requirement as per ANSI B16.34.			
	However, Bidder may offer valves with body and trim materials better than specified materials and in such cases Bidder shall furnish the comparison of properties including cavitation resistance, hardness, tensile strength, strain energy, corrosion resistance and erosion resistance etc. of the offered material vis-a-vis the specified material for Employer's consideration and approval.			
SINGARENI THERMAL POWER PROJECT (2X600 MW) BOILER TURBINE GENERATOR PACKAGE		TECHNICAL SPECIFICATION SECTION –VI PART-B		III-C-10 CONTROL VALVES, ACTUATORS & ACCESSORIES
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CLAUSE NO.	TECHNICAL REQUIREMENTS																			
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 equal to or greater than that of the control valve body.																			
5.00.00	VALVE ACTUATORS All control valves shall be furnished with pneumatic actuators except for pressure and temperature control valve for auxiliary PRDS application (electro-hydraulic / pneumatically operated) and separator drain control valve (electro-hydraulic type).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. 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/sq.cm. per linear millimeter of seating surface, shall be provided in the selection of the actuator to ensure tight seating unless otherwise specified. The travel time of the pneumatic actuators shall not exceed 10 seconds.																			
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	SPECIFICATIONS FOR MICROPROCESSOR BASED ELECTRONIC POSITIONER <table><tr><td rowspan="4">1</td><td rowspan="4">Electrical</td><td>a) Input Demand Signal</td><td>4-20 mA</td></tr><tr><td>b) Power Supply</td><td>Loop Powered from the output card of Control System.</td></tr><tr><td>c) HART Protocol</td><td>Compatibility for Remote Calibration & Diagnostics (Super-imposed HART signal on input Signal (4-20 mA))</td></tr><tr><td>d. Valve position sensing</td><td>Position sensing, 4-20 mA output signal to be provided for control system.</td></tr><tr><td rowspan="2">2</td><td rowspan="2">Environment</td><td>a) Operating temp.</td><td>(-)30 To 80 Deg. C</td></tr><tr><td>b) Humidity</td><td>0-95 %</td></tr></table>				1	Electrical	a) Input Demand Signal	4-20 mA	b) Power Supply	Loop Powered from the output card of Control System.	c) HART Protocol	Compatibility for Remote Calibration & Diagnostics (Super-imposed HART signal on input Signal (4-20 mA))	d. Valve position sensing	Position sensing, 4-20 mA output signal to be provided for control system.	2	Environment	a) Operating temp.	(-)30 To 80 Deg. C	b) Humidity	0-95 %
1	Electrical	a) Input Demand Signal	4-20 mA																	
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2	Environment	a) Operating temp.	(-)30 To 80 Deg. C																	
		b) Humidity	0-95 %																	
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CLAUSE NO.	TECHNICAL REQUIREMENTS				
			c) Protection class	IP-65 Minimum	
	3	Software for Configuration and Diagnostics	Software	Windows based software. Software shall meet the requirements for Configuration, Diagnostics, Calibration and Testing of the actuator.	
			Diagnostic/Test features	Advanced diagnostic features like Stroke counter or Travel counter, Leakage in actuators, Valve Signature analysis, Step Response test, Valve friction /Jamming detection etc to be provided.	
	4	Test reports/ Certificates	Factory Valve Signature Tests Reports (Pr Vs Valve travel and Travel Vs I/P signal) are to be provided.		
			Test certificates as per Manufacture Standard/Relevant Standard are to be submitted.		
	5	Configuration/ Calibration.	Remote & Local Calibration, Auto & Manual Calibration shall be possible.		
	6	Operating Range	Full range/ Split range.		
	7	Modes	Valve Action	Direct / Reverse Valve Action	
			Flow Characterization	Possible to fit Valve Characteristic Curves- Linear , Equal percentage etc.	
	8	Fail Safe/Fail Freeze	Fail Safe/Fail Freeze feature is to be provided. (In case the fail freeze feature is not intrinsic to the positioner, Bidder shall achieve the same externally through solenoid valve connected in the pneumatic circuit).		
	9	Pneumatic	Air capacity	Sufficient to handle the valves & actuators selected/ Boosters to be supplied, if required.	
			Air pressure	To suit the air supply pressure/quality available.	
			Process connection	¼" NPT	
	10	Performance	Characteristic deviation	<=0.5 % of span.	
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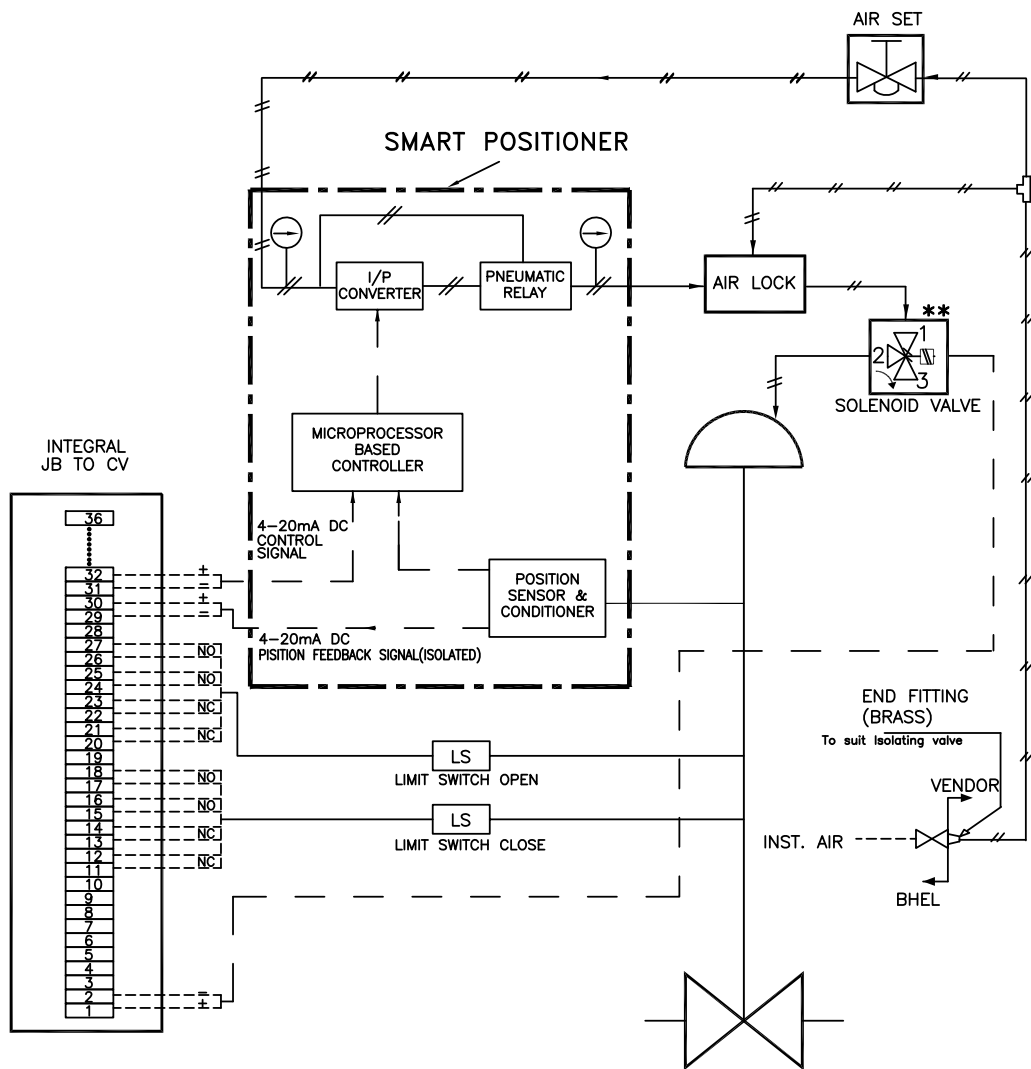
CLAUSE NO.	<div style="text-align: center;"> TECHNICAL REQUIREMENTS  </div>			
			Ambient temp effect	<=0.01 %/ deg C or better.
	10	EMC & CE Compliance	Required to International Standard like EN/IEC.	EN50081-2 & EN50082 or equivalent.
	11	Accessories	In-built Operator Panel	Display with push buttons for configuration and display on the positioner itself (Password protected/Hardware lock).
			Hand Held Hart Calibrator	Universal Hart Calibrator to be provided (for quantity, refer <i>Part-A: Contract quantities</i> of the specification).
			Press Gauge Block	For supply & output pressures, Air Filter Regulator and other accessories shall be provided on as required basis for making system complete.
			Electrical Cable Entry	1/2"NPT, side or bottom entry to avoid water ingress.
			Valves Mounting Assembly	For Sliding Stem/Rotary/Single acting/Double acting actuators on as required basis
<p>* Note:</p> <p>Employer is providing a centralized HART management system including the HART multiplexing/ interfacing system. The HART signals shall be picked up from marshalling terminals of DDCMIS (SG/TG DDCMIS as well as BOP DDCMIS), as applicable. The details of the above mentioned employer's HART management system are as below:</p> <p>The following functionalities are achieved through industry standard softwares of the HART management system for electronic transmitters, temperature transmitters and analysers:</p> <ol style="list-style-type: none"> Constant scanning to monitor faults or changes to instrument configuration. Employer-defined and standard calibration and configuration procedures for all transmitters. Constant signal data collection facilities to maintain continuously updated records. Automatic tracking of configuration changes made in the field, such as may be introduced by hand-held communicator. All configuration function associated with hand-held communicators shall be available in the system. 				
SINGARENI THERMAL POWER PROJECT (2X600 MW) BOILER-TURBINE-GENERATOR PACKAGE		TECHNICAL SPECIFICATION SECTION—VI PART-B		III-C-10 CONTROL VALVES, ACTUATORS & ACCESSORIES <div style="text-align: right;">PAGE 7 OF 15</div>

CLAUSE NO.	TECHNICAL REQUIREMENTS			
8.00.00	e) Event and log reports on screen as well as on printer.			
	f) Any addition/deletion of transmitter will be reported on printer and logged in hard disk.			
	Further, the positioners shall be monitored from the above described HART management system .To achieve this, Bidder shall provide the necessary software to achieve the functionalities described above under "Remote Configuration and Diagnostics", and this software shall be loaded in the Employer's HART management system.			
	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 of 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: Please refer CI No. 1.00.00, Sub-section IV:19 (Type test requirements), Control Valves.			
	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.			
SINGARENI THERMAL POWER PROJECT (2X600 MW) BOILER TURBINE GENERATOR PACKAGE		TECHNICAL SPECIFICATION SECTION –VI PART-B		III-C-10 CONTROL VALVES, ACTUATORS & ACCESSORIES
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TITLE

CONTROL VALVE HOOK-UP DIAGRAM WITH SMART POSITIONER SCCL TPP, 2 X 600 MW



NOTE:—

- SOLENOID VALVE WILL BE PROVIDED ONLY FOR ON/OFF DUTY VALVES & FOR CONTROL VALVES WHERE OPEN/CLOSE INTERLOCK IS REQUIRED AND INDICATED IN RESPECTIVE DATA SHEETS.
- SOLENOID VALVES PORT CONDITION:
PORT 1 & 2 SHAL BE CONNECTED UNDER DE-ENERGISED CONDITION.
PORT 2 & 3 SHAL BE CONNECTED UNDER ENERGISED CONDITION.
- FOR ON/OFF DUTY PNEUMATIC CONTROL VALVE, SMART POSITIONER SHALL NOT BE APPLICABLE.
- JB TERMINALS SHALL BE CAGE CLAMP TYPE SUITABLE FOR 2.5 SQ. MM COPPER WIRE.
- 15 METERS 1/4 " PVC COATED COPPER TUBING AND 1 SET OF FITTINGS TO BE SUPPLIED FOR EACH CONTROL VALVE FOR CONNECTION TO ISO VALVE AT INST AIR HEADER ON ONE END AND TO AIR LOCK RELAY/AIR FILTER REGULATOR ON THE OTHER END.
- VOLUME BOOSTER IF REQUIRED SHALL BE PROVIDED.

** APPLICABLE TO VALVES WHERE OPEN/CLOSE ACTION REQUIRED ON INTERLOCK CONDITION



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4.0.0 SPARES, CONSUMABLE AND SPECIFIED TOOLS & TACKLES (For all Units):

4.1.1 Commissioning Spares & Consumables

The bidder shall supply spares and consumables for all the above valves & desuperheater required during start-up. A list of all spares and consumables to be supplied shall be submitted along with the bid.

4.1.2 Recommended Spares

The bidder shall submit a list of recommended spares for all the above valves and desuperheaters for three years of normal operation. These are to be quoted separately & unit prices to be indicated, to enable placement of a separate order later if required.

4.1.3 Special Tools & Tackles

The bidder shall supply one complete set of special tools & tackles required for the erection, assembly, disassembly & maintenance of the equipment. A list of such tools & tackles to be supplied shall be submitted along with the bid.

4.1.4 Bidder to indicate the service life expectancy period for the spare parts under normal working conditions. The spares shall be treated and packed for long storage under climatic conditions prevailing at site. Small items shall be packed in sealed transparent plastic bags with desiccators' packs as necessary.

5.0.0 SPARES: The following spares are required to be offered.

a) Stat-up & Commissioning spares:

- i) Start-up and Commissioning spares are those spares, which may be required during the start-up and commissioning of the Control Valves. All start-up spares, which are supplied under this contract, shall be strictly interchangeable with the parts for which they are intended for replacements. The format for price schedule to be filled-up by the bidder is enclosed in Volume-III
- ii) The Start-up and commissioning spares indicated by the bidder shall be a part of the main Control valves supply. However bidder to indicate prices separately. The list of these spares required to be supplied shall be submitted along with the bid.

LIST OF COMMISSIONING SPARES

S.No.	ITEM DESCRIPTION	QUANTITY REQUIRED (per unit)
1	Gaskets	One (1) set with each control valve Tag
2	Gland Packings	One (1) set with each control valve Tag
3	Cu Tubing	15 meters against each valve



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5.1.0 LIST OF MANDATORY SPARES

Steam Pressure reducing cum desuperheating System (APRDS SYSTEM)#		
High Capacity PRDS System (on MS line)		
a	Desuperheater Liners	1 set
Pressure Reducing cum Desuperheating Valve		
a	stem	1 no.
b	dics	1 no.
c	Body seat ring	2 nos.
d	Gland Packing	2 nos.
e	Pressure seal ring	2 nos.
f	Gasket	2 nos.
For Spray Control valves to HC-PRDS (including Block valve)		
a	Valve trim (including cage, plug, stem)	1 no. for each size, type & rating
b	Seat Ring	
c	Guide Bushing	
d	Stem Packing	
Low Capacity PRDS System (CRH)		
LC-PRV		
a	stem	1 no.
b	dics	1 no.
c	Body seat ring	2 nos.
d	Gland Packing	2 nos.
e	Pressure seal ring	2 nos.
f	Gasket	2 nos.
For Spray Control valves to LT-DESUPERHEATER		
a	Valve trim (including cage, plug, stem)	1 no. for each size, type & rating
b	Seat Ring	
c	Guide Bushing	
d	Stem Packing	

6.0.0 INFORMATION TO BE FURNISHED ALONGWITH THE OFFER BY THE BIDDER.

The bidder shall submit four (04) sets of the following drawings and data along with the bid without which the offer will be deemed incomplete.

6.1.0. Calculations for valve sizing, actuator sizing, valve velocities and noise level.



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- 6.2.0. Dimensioned outline drawing giving overall dimensions, material.
- 6.3.0. Duly filled technical data sheets 'B' for each control valve & desuperheater in the Proforma enclosed in volume III of this specification.
- 6.4.0. Hook-up diagram of control valves with actuator & accessories.
- 6.5.0. Reference list, Catalogue & Technical bulletins for various items being offered.
- 6.6.0. Any deviations from the specification / data sheet & reasons thereof.
- 6.7.0. Schedules as in Vol. III.
- 6.8.0. Quality Plan for the equipment offered in the format enclosed with this specification.
- 6.9.0. Field quality plan.
- 6.10.0. List of commissioning and recommended spares.
- 6.11.0. List of tools & tackles.
- 6.12.0. List of consumables / lubricants.

7.0.0 DRAWING

For general arrangement and terminal point details refer enclosed drawings nos. PE-DG-381-142-N101 in Volume II B Sec. D.

8.0.0 QUALITY PLAN

The bidder shall furnish quality plan along with the offer and the same shall be finalized before the issue of LOI.

Detailed quality plan shall be submitted by the successful tenderer after the placement of order for each project during contract execution for final approval by BHEL / its customer. BHEL / its customer shall indicate Customer Hold Points (CHP) in the approved quality plan beyond which work shall not proceed without the approval of BHEL / its customer for any particular project during final execution.

The quality plans enclosed in volume-II-B 'D' of the specification are for bidder's guidance only and are not exhaustive. The bidder shall comply with these and other minimum requirements specified in the specification and shall furnish his own quality plan in BHEL/Customer formats in the event of order based on the guidance given as above for BHEL/Customer's approval.



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DATA SHEET- A-1

SIZING DATA FOR SPRAY CONTROL VALVE TO HC-PRDS (FDV-53/54/58/59)

For
2x600 MW, SCCL-SINGARENI TPP

SL. NO	PARAMETERS	CASE-I	CASE-II	CASE-IV	CASE-V	CASE-VI	CASE-VII	CASE-VIII	MECH. DESIGN
1.0	INLET PARAMETERS TO COMBINED TYPE PRDS (ASV-22)								
1.1	PRESSURE (Kg/Cm ² a)	42	96	170	170	170	85	65	189.9
1.2	TEMP. (°C)	320 / 336	488	537	537	537	465	350	545
1.3	FLOW (T/HR)	Bidder to calculate							
2.0	PARAMETERS AT OUTLET OF COMBINED TYPE PRDS (ASV-22)								
2.1	PRESSURE (Kg/Cm ² a)	16	16	16	16	16	16	16	21
2.2	TEMP. (°C)	310	310	310	310	310	310	297	350
2.3	FLOW (T/HR)	91.9	53.53	66.29	148.83	170.89	113.61	74.7	-
3.0	INLET OF BLOCK SPRAY VALVE (INLET OF PRESSURE CONTROL VALVE)								
3.1	PRESSURE (Kg/Cm ² a)	119	114	213	213	213	118	115	336
3.2	TEMP. (°C)	110	140	165	165	165	140	110	180
3.3	FLOW (T/HR)	Bidder to calculate							

NOTE:

- Case-1 is the capability check point for PRV ASV-22. Case-V is the capability check point for Spray Water control valves.
- Spray control station shall have two valves-one pressure control valve & other as Temp. control valve, in addition to the common block valve for spray to high temp. and low temp. desuperheaters.
- Pressure d/s of pressure control valve shall be approx. 50Kg/ Cm²(a) (TO BE DECIDED BY BIDDER). Spray station shall be sized accordingly.



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DATA SHEET- A-2
SIZING DATA FOR AUXILIARY STEAM PRDS (LC-PRV (ASV-65))

For
2x600 MW, SCCL-SINGARENI TPP

<u>S.NO</u>	<u>PARAMETERS</u>	<u>CASE-III (SP)</u>	<u>CASE-III (CP)</u>	<u>CASE-IV</u>	<u>CASE-IX (SP)</u>	<u>CASE-IX (CP)</u>	<u>MECH. DESIGN</u>
1.0	INLET PARAMETERS OF PRV (ASV-65)						
1.1	PRESSURE (Kg/Cm ² a)	17.29	17.39	42.93	17.29	17.39	55
1.2	TEMP. (°C)	334.8	298.1	331.6	334.8	298.1	360
1.3	FLOW (T/HR)	10.66	10.95	10.89	14.66	14.95	-
2.0	OUTLET PARAMETERS OF PRV (ASV-65)						
2.1	PRESSURE (Kg/Cm ² a)	16	16	16	16	16	55
2.2	FLOW (T/HR)	10.66	10.95	10.89	14.66	14.95	-

NOTE:

a) Case-IX is the capability check point for PRV ASV-65.



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DATA SHEET- A-3
SIZING DATA FOR SPRAY CONTROL VALVE TO LT-DESH (FDV-62/63/67/68)

For
2x600 MW, SCCL-SINGARENI TPP

Sl. No.	PARAMETERS	CASE-I	CASE-II	CASE-III (a/b/c)	CASE-IV	CASE-V	CASE-VI	CASE-VII	CASE-VIII	CASE-IX (a/b)	MECH. DESIGN N
1.0	PARAMETERS AT DESUPERHEATER INLET (DESH-2)										
1.1	PRESSURE (Kg/Cm ² a)	16	16	16	16	16	16	16	16	16	21
1.2	TEMP. (°C)	310	310	333 / 296 / 302	310	310	310	310	299	333 / 296	350
1.3	FLOW (T/HR)	Bidder to calculate									
2.0	PARAMETERS AT DESUPERHEATER OUTLET (DESH-2)										
2.1	PRESSURE (Kg/Cm ² a)	16	16	16	16	16	16	16	16	16	21
2.2	TEMP. (°C)	210	210	210	210	210	210	210	210	210	250
2.2	FLOW (T/HR)	80.70	49.70	11.50	39.0	110.7	124.7	94.7	49.7	11.5	-
3.0	INLET OF BLOCK SPRAY VALVE (INLET OF PRESSURE CONTROL VALVE)										
3.1	PRESSURE (Kg/Cm ² a)	119	114	85 / 213 / 213	213	213	213	118	115	85 / 213	336
3.2	TEMP. (°C)	110	140	140 / 165 / 165	165	165	165	140	110	140 / 165	180
3.3	FLOW (T/HR)	Bidder to calculate									

NOTE:

1. Spray control station shall have two valves-one pressure control valve & other as Temp. control valve, in addition to the common block valve for spray to high temp. and low temp. desuperheaters.
2. Pressure d/s of pressure control valve shall be 50Kg/ Cm²(a) (TO BE DECIDED BY BIDDER). Spray station shall be sized accordingly.



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EQUIPMENT SPECIFICATIONS

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EQUIPMENT SPECIFICATIONS



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EQUIPMENT SPECIFICATIONS

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SECTION – D
EQUIPMENT SPECIFICATIONS
FOR
CONTROL VALVE WITH PNEUMATIC ACTUATOR



SPECIFICATION FOR CONTROL VALVE (WITH PNEUMATIC / ELECTRIC ACTUATOR)

SPECIFICATION NO.: PES – 145 - 06		
VOLUME	II B	
SECTION	D	
REV. NO.	05	DATE : 15-05-2007
SHEET	1	OF 12

1.0 SCOPE

This specification covers the Design, Manufacture, Inspection and Testing at the manufacturer's works, proper packing for transportation and delivery to site of Control valve (with Pneumatic/Electric Actuator) for use in Utility/Captive Power Station/Combined Cycle Station.

2.0 CODES AND STANDARDS

2.1 All the equipments specified herein shall comply with the requirements of the latest issue of the relevant National and International standards.

2.2 The Design and Materials used for the components shall also comply with the relevant National and International standards.

2.3 As a minimum requirement, the following standards shall be complied with :

Indian Boiler Regulation (IBR)		
Allowable Seat leakage	:	ANSI-B16.104 / FCI-70.2
Pressure & Temperature ratings	:	ANSI-B16.34
Enclosure class	:	IEC-144 / NEMA / IS-13947
Control Valves	:	ISA S-75
Electric Motor operated Actuators	:	IS-9334

3.0 TECHNICAL REQUIREMENTS

The Control valve, Actuator and the accessories shall be suitable for continuous operation under an ambient temperature of 0-55°C and Relative Humidity of 0-95% unless specified otherwise in volume IIB Section-B or Section-C.

3.1 Control Valve

The control valve shall be suitably designed for the operating conditions and system characteristics as specified in the Data Sheet-A.

3.1.1 The control valve shall be of globe body design with single port. The valve trim, shall be suitable for quick removal without any cutting or welding.

3.1.2 The material of body, internals and packing shall be as specified in the data sheets. Alternatives, considered more suitable for service specified may be given as alternative offer, along with adequate justification. However main offer shall totally meet specification requirements. Asbestos shall not be used for the packing or any other component.

3.1.3 The valve bonnet and packing shall be suitable for the service conditions as in Data Sheet-A. Gland sealed type bonnets are not acceptable. Double packing is mandatory for applications involving vacuum service. Bonnets having teflon packing shall have valve stem finished to 2-4 microns. Packing material requiring lubrication will not be acceptable. Justification for proper selection of bonnet & packing shall be furnished in the bid.

3.1.4 The valve end connection as specified in Data Sheet-A shall conform to ANSI B16.25 for Butt Weld connection and ANSI B16.5 for flanged ends. End to end dimension shall be as per ANSI 16.10.

3.1.5 The valve seat leakage shall be as per ANSI B16.104 / FCI-70.2. The leakage class shall be as per Data Sheet-A.



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(WITH PNEUMATIC / ELECTRIC ACTUATOR)**

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- 3.1.6 The valve body shall have the direction of flow embossed on all valves.
- 3.1.7 The sizing shall conform to the requirements of ANSI/ISA(S75- 01), and the valve capacity shall be selected so as to meet the following:
- | | | | | |
|--|---|---|---|--------------------|
| Valve with Linear characteristic. | - | Normal Flow (Design Point) | : | 70-75% valve lift. |
| | - | Max. Flow | : | 90% valve lift. |
| | - | Min. Flow | : | >10% valve lift. |
| Valve with Equipercentage Characteristic | - | Normal Flow (Design Point) | : | 75-85% valve lift. |
| | - | Max. Flow | : | 90% valve lift. |
| | - | Min. Flow | : | >10% valve lift. |
| ON/OFF Quick open Characteristic | - | 1.1 times the CV calculated on the basis of maximum flow condition. | | |
- 3.1.8 Calculation for valve sizing, velocity and noise shall be subject to purchaser's approval during contract stage. However responsibility of proper selection and design for the duties specified lies with the vendor. Any modifications required to be done on the valves or actuators & accessories to achieve satisfactory performance of the control system shall be done without any commercial implication.
- 3.1.9 Suitable justification and evidence shall be furnished regarding proper selection of the valve.
- 3.1.10 The valve outlet velocities shall be limited to the following values, unless otherwise specified in the Data sheet-A.
- | | | | |
|-----|----------------|----|--|
| i) | Liquid service | <= | 7 Metres/Sec. |
| ii) | Steam service | <= | 1/3 Sonic velocity in the flow medium. |
- 3.1.11 For flashing duty, the trim design shall be such that the vapour bubbles are kept away from valve body.
- 3.1.12 For cavitation service, the trim design shall be of multistage pressure drop type, so as to avoid cavitation altogether, instead of keeping cavitation away from valve parts.
- 3.1.13 In case of predicted noise level above 85 dBA, suitable low noise trim or inbuilt diffusers shall be provided to bring down the noise level below 85dBA.
- 3.1.14 The equivalent weighted sound level measured at 1.5M. above floor level in elevation and one metre horizontally from the control valve expressed in decibels to a reference of 0.0002 microbar shall not exceed 85 dBA (without pipe insulation). The offer shall include noise prediction calculations for each valve.
- 3.1.15 In case of wrong selection/mal operation of valve and for associated actuator during guarantee period, the vendor shall replace the valve suitably with a modified/new valve of design as approved by purchaser and all the expenses for replacement, rectification/modification including transportation both ways will be at vendor's expenses.



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3.2 Pneumatic Actuator

The pneumatic actuators shall be employed for modulating or open/close duty, as specified in Data Sheet-A. The bidder shall be responsible for proper selection and sizing of valve actuators in accordance with the pressure drops and shut off pressure.

3.2.1 The pneumatic spring opposed diaphragm actuator for modulating duty shall be capable of positioning the associated valve at desired opening for all the operating conditions specified.

3.2.2 The pneumatic actuator for open/close duty shall be suitable for fast opening/closing of the associated valve.

3.2.3 The actuator design shall allow valve assembly to be mounted at 45° inclination on either side in the vertical plane.

3.2.4 The actuators shall be suitably sized to ensure that the associated valve travel time from full open to full closed position and vice versa is less than 20 seconds under the most stringent service conditions.

3.2.5 The actuator shall be painted with epoxy based paint.

3.3 Accessories for Control valve with Pneumatic Actuator

The bidder shall offer all the accessories as specified in the Data Sheet - A for the Pneumatic Actuators under modulating or OPEN/CLOSE duty. The accessories specified shall be supplied duly mounted on the valve actuator and piped with PVC covered copper tube and flare less brass fittings (Refer typical hook up diagram in sheet 12 of 12).

3.3.1 Hand wheel

Hand wheel shall have OPEN & CLOSE direction marking and clockwise rotation as viewed from front shall close the valve. The hand wheel shall have a circular stainless steel plate with Tag number and service.

3.3.2 Local Position Indicator

Each actuator shall be provided with a mechanical pointer attached to stem, moving over a graduated scale with markings, for OPEN, 25%, 50%, 75%, CLOSE positions.

3.3.3 Position Transmitter

The position transmitter shall be supplied as indicated in Data Sheet-A. The electronic position transmitter shall be non-contact type with 4-20 mA DC 2-wire output suitable for 12-50V DC supply. The resistance type position transmitter shall have 0-100 ohm variation for valve position change of 0-100%. The position transmitters of both types shall have accuracy and enclosure class. Necessary cable glands shall be supplied.



SPECIFICATION FOR CONTROL VALVE (WITH PNEUMATIC / ELECTRIC ACTUATOR)

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3.3.4 Air Filter Regulator

Instrument quality air at suitable pressure of 5.5 Kg/Cm2(g) to 7 Kg/Cm2(g) shall be supplied to each valve through air filter regulator. The filter regulator shall include an inbuilt blow-down valve, 5 micron size filter. The design pressure for regulator shall be 7 Kg/cm2g. The Air filter regulator shall be selected to meet the requirements of positioner/actuator, E/P convertor and air-lock. The flow capacity of the Air filter regulator shall be variable with a knob. Output gauge shall be provided wherever pneumatic positioner is not specified for the valve.

3.3.5 Air Lock Relay

Air lock relay shall retain the valve position stayput, in case of air supply failure and shall reset automatically on resumption of air supply. Air lock shall have a threaded plug for evacuating diaphragm air if required for local manual operation.

3.3.6 Solenoid Valves

Solenoid valves are meant for interlock & protection purposes overriding the controller signal, and/or to result stayput action on controller signal failure. The Solenoid valve shall be 3-way **Universal** type and the valve internals shall be of stainless steel. The coil shall have class-H insulation and rated for continuous AC/DC duty as specified in Data sheet-A. The enclosure shall be to IP-55. Cable gland shall be provided for cable entry. The solenoid shall in general conform to IS-8935. The solenoid operation shall be universal type. The solenoid shall be suitable for 24V DC supply, unless specified otherwise in Data Sheet-A.

3.3.7 Limit Switches

Limit switches are required as specified in the data sheet-A. Each limit switch shall have 2NO+2NC contacts with contact rating of 5A at 240V AC/0.2A at 220V DC unless otherwise specified. The switch enclosure shall conform to IP-55. Each limit switch shall be supplied with cable glands.

3.3.8 I/P Converter


I/P Converters shall preferably be of force balance type and shall produce pneumatic output signal corresponding to input current signal, also specified in Data Sheet. Convertor electronics shall be protected against reverse connection of signal polarities and a separate external connection shall be provided to facilitate grounding of instrument casing. Cable glands with neoprene gromets suitable for PVC cables shall be provided. I/P convertor shall have span adjustment facility. I/P convertor enclosure shall conform to IP-55 enclosure class.

3.3.9 Positioner

Positioner shall be suitable for accepting controller output signal 0.2-1.0 Kg/cm2, 0.2-0.6 Kg/cm2 or 0.6-1.0 Kg/cm2 as specified and give an output suitable for the actuator. Pneumatic positioner shall have 3 gauges. All gauges shall have metric scales. The positioner input signal range shall be adjustable. Wherever applicable, it shall be possible to bypass the positioner by means of a switch. **Linearity and Hysteresis shall be as indicated in Data sheet-A**

3.3.10 Electro pneumatic Positioner

In place of separate E/P Converter and pneumatic positioner a combined electro pneumatic positioner can also be supplied. The electro pneumatic positioner shall have 2 gauges.

	SPECIFICATION FOR CONTROL VALVE (WITH PNEUMATIC / ELECTRIC ACTUATOR)	SPECIFICATION NO.: PES – 145 - 06			
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3.3.11

Junction Box

Wherever specified, an integral junction box with all electrical accessories conduited up to JB shall be supplied. The junction box shall have two (2) cable glands for outgoing cables. Junction box shall have enclosure class of IP-55.

3.4

Guarantee & Performance

3.4.1

The overall performance of the control valve with pneumatic actuator assembly shall be as follows:-

i)

Hysteresis

:

± 1% of span

ii)

Linearity

:

± 2% of span

iii)

Sensitivity

:

± 0.5% of span.

iv)

Repeatability

:

± 1% of span

v)

Accuracy (Overall)

:

± 2% of span

3.4.2

The guarantee for the control valve, pneumatic actuator & accessories shall be for 12 months continuous operation from the date of commissioning, unless specified otherwise in VOL-IIB Section-B or Section-C.

3.5

Electric Actuator

The electric actuator shall be employed for modulating duty.

3.5.1

The actuator assembly shall be complete with drive motors, gears, hand wheel, signaling & switching units, associated control, integral starter, (when specified) and other accessories as required.

3.5.2

The Electric Actuator shall be capable of positioning the associated valve at the desired opening for all the operating conditions.

3.5.3

The motor shall meet the requirements of Current, torque, Axial thrust, Accelerating & stall time as imposed by the driven equipment.

3.5.4

The motor shall be suitable for direct on line starting.

3.5.5

Motors shall be suitable for inching & plugging duty operations.

3.5.6

The motors shall be capable of starting and accelerating to rated speed at 85% of rated voltage.

3.5.7

The motors shall be rated for continuous operations for modulating duty.

3.5.8

The motor shall operate satisfactorily under the following conditions:

i)

±10% supply voltage variation at rated frequency.

ii)

-5% to + 3% variation in frequency at rated supply voltage.

iii)

Simultaneous variation in voltage and frequency, the sum of absolute percentage not exceeding 10%.

3.5.9

The Actuator shall be suitable for mounting directly on the valve and shall be suitable for mounting in any position. Supports required for inclined mounting shall form part of supply of valve assembly.

3.5.10

The actuator shall be capable of producing the required torque and thrust at the output shaft for satisfactory operation of the associated valve.



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- 3.5.11 Each actuator shall have a hand wheel for emergency operation. The hand wheel shall be designed such that it is declutched automatically when the power supply to the motor is restarted.
- 3.5.12 The hand wheel shall be so arranged that when looking from hand wheel, the valve is closed by rotating the hand wheel in clockwise direction.
- 3.5.13 Motor shall be totally enclosed conforming to IP-65 or better as per data sheet. The enclosure shall be suitable to protect the motor from leakage steam, water or oil from valve joints and glands.
- 3.5.14 Where flameproof enclosures are specified, it shall meet the specification IS-2148.
- 3.5.15 Insulation shall be at least class-B or better and shall be tropicalised to withstand the atmospheric condition.
- 3.5.16 The actuator shall be provided with antifriction bearing in grease filled cartridge.
- 3.5.17 Each actuator shall be provided with a mechanical position indicator to indicate accurately the valve position.
- 3.5.18 The integral starter, if specified in data sheet-A, shall be provided in weatherproof enclosure with protection class not less than IP-65 or better as per data sheet.

The integral starter shall consist of:

- i) Mechanical & Electrically interlocked reversing contractors suitable for class AC4 duty or Thyristor as per data sheet.
- ii) Thermal overload relay.
- iii) Step down control transformer with fuses.
- iv) Interposing relay.
- v) Monitoring relay..
- vi) Open, Close & Stop push buttons.
- vii) Indicating lamps.
- viii) Local-Remote lockable selector switch with spare potential free contacts, wired for remote interface.
- ix) A potential free contact shall be provided for remote annunciation of power failure/overload condition. The contact shall be SPDT, rated for at 5A 240V AC or 0.2A at 220V DC.



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- 3.5.19 The actuator shall be suitably time rated for the duty cycle involved with the necessary number of starts per hour, but in no case, less than 1200 starts per hour.
- 3.5.20 The actuator shall be provided with a suitable control unit for receiving 4-20 mA signal from remote controller.
- 3.5.21 The servomotor gear should have self locking or suitable brake so as to maintain it's last position as and when the motor power is switched off.
- 3.5.22 Thermostat/Thermistor as specified in the data sheet shall be provided for sensing the winding temperature and giving trip command. The trip contact shall be change over type. The contact shall be wired up to the actuator terminal box.
- 3.6 Accessories for Control Valve with Electric Actuator
- 3.6.1 Torque Switches
- i) Each actuator shall be provided with at least one open and one close torque switches each with 2 NO+2 NC contacts. The contacts shall be rated for 5A at 240V AC or 0.2A at 220V DC.
 - ii) The torque switches shall have a minimum accuracy $\pm 3\%$ of set value.
 - iii) The torque switches shall be provided with calibrated knobs for setting desired torque. Separate knobs shall be provided for close and open torque switches.
 - iv) The torque switches shall be provided with mechanical latching device to prevent operation when unsealing from the positions. The latching device shall unlatch as soon as the valve leaves the end position. If such provision is not possible, the torque switches shall be bypassed by end position limit switches, which open on valve leaving end position. These limit switches are additional to the number of limit switches specified elsewhere.
 - v) The torque switches or worm gear shall be self-locking type so that when torque switch operates it remains operated until the actuator is operated in the reverse.
 - vi) The torque switch enclosure shall conform to IP-55.
- 3.6.2 Limit Switches
- Each limit switch shall have 2NO+2NC contact with contacts rated for 5A 240V AC/0.2A 220V DC unless otherwise specified. The switch enclosure shall conform to IP-55. Each limit switch shall be supplied with cable glands.
- 3.6.3 Space Heater
- A space heater shall be provided in limit switch and starter compartments to prevent condensation. This shall be suitable for the power supply specified in the data sheet. Where integral starters are provided the space heaters shall be wired to control supply within the actuator.



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3.6.4 Remote Position Transmitter

The position transmitter shall be supplied as indicated in Data Sheet-A. The electronic position transmitter shall be non-contact type with 4-20mA DC 2-wire output suitable for 12-50V DC supply. The resistance type position transmitter shall have 0- 100 ohm variation for valve position change of 0-100%. The position transmitters of both types shall have $\pm 1\%$ accuracy. The enclosure shall conform to IP-55. Necessary cable glands shall be supplied.

3.6.5 Wiring

- i) The actuator and the accessories will be neatly wired up to the terminal boxes.
- ii) The internal wiring shall be minimum of 1 mm² stranded PVC insulated copper conductor.
- iii) The wiring shall be identified by means of numbered ferrules on both ends of all wires.

3.7 Terminal and Terminal boxes

3.7.1 Motor Terminal Box

- i) The terminals, terminal boards, terminal boxes, winding tails and associated equipment shall be suitable for connection to supply system having short circuit capacity specified in data sheet and clearance time determined by the associated fuses.
- ii) The terminals shall be stud type insulated from the frame. The insulation shall not be porcelain. The studs shall be of brass or stainless steel or phosphor bronze of adequate size.
- iii) The terminal box shall be totally enclosed conforming to degree of protection IP-65.

3.7.2 Actuator Terminal Box

- i) All terminals of limit and torque switches, space heater, position transmitters, thermostat/thermister shall be brought to a common terminal box. The enclosure shall be to degree of protection IP-65.
- ii) Terminal board with plug in connector shall be provided. Alternatively stud type or insertion type may be considered. Pinch screw type however will not be accepted. All terminals shall be shrouded to prevent accidental contact. Where stud type terminals are offered, it shall be as per clause 3.7.1 (ii).
- iii) There shall be at least five terminals spare to terminate spare cores of cable.

3.7.3 Cable Glands

The motor terminal box and actuator terminal box shall be provided with required number of double compression nickel plated brass cable glands to suit cable type and associated size.

3.7.4 Earthing Terminal

Two earthing terminal shall be provided on either side of motor and actuator terminal box.

3.7.5 Painting

The Actuator shall be painted with epoxy-based paint.



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4.0 TESTING AND INSPECTION

4.1 The bidder shall adopt suitable quality assurance plan to ensure that the equipments offered will meet the specification requirements in full.

4.2 The bidder shall furnish the Quality Plan in the format enclosed in volume-III. In case the Quality Plan(s) is/are included in volume-IIB, the bidder shall furnish his Quality Plan strictly in line with the same. The Quality Plan shall be discussed and finalised with the technically accepted bidders before opening the price bid. The stages where purchaser would like to be associated for witnessing or verification of tests would be indicated by the purchaser in the Quality Plan before approval.

4.3 The following test shall be conducted as a minimum requirement.

4.3.1 Control Valve

- i) Radiographic tests on castings.
- ii) Dye penetrant tests on machined surface.
- iii) Ultrasonic tests for the forgings & bars of all valves with 60 Kg/cm² & higher ratings.
- iv) Hydrostatic tests as per ANSI B 16.34 prior to seat leakage tests.
- v) Valve closure and seat leakage tests as per ANSI B 16.104 / FCI-70.2.

4.3.2 Pneumatic Actuators

Functional test of actuator and each accessory.

4.3.3 Electric Actuator

- i) Routine tests on motors as per IS: 325.
- ii) Functional test on actuator and each accessory.
- iii) Insulation resistance and high voltage test.
- iv) Stall current & Stall torque test.
- v) Output shaft speed and torque of actuator and corresponding current tests.

4.3.4 Control valve with Actuator & Accessories fully assembled

- i) Functional tests of control valve operation along with actuator & accessories.
- ii) Dimension checks.

4.3.5 Type tests or Test Reports

- i) Valve lift vs. Flow test (Cv Test)
- ii) Degree of protection tests for the enclosures
- ii) Temperature rise test (applicable for Electrical Actuator only).
- iii) Type test for motor as per IS: 325.

4.4 Inspection will be conducted by BHEL and/or their authorised representatives as per the agreed inspection schedule. The inspection schedule will be submitted by the bidder, for BHEL's approval at contract stage. The cost of all tests and inspections will be deemed to have been included in the bid. For all the type tests covered under 4.3.5 above, "Type Test Certificates" as per agreed Quality Plan shall be furnished. In the absence of the same, such Type Tests shall be arranged at the Vendor's works in the presence of BHEL and/or their authorised representatives or in independent Test House/Laboratory approved by BHEL.

4.5 The Standard QP is included in this specification to enable bidder to understand the extent of inspection and testing requirements to execute this job. The successful bidder has to follow the agreed QP, taking care of customer requirements mentioned in Sec-C and submit QP for final approval by BHEL / Customer.



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5.0 SPARES AND CONSUMABLES

5.1 Commissioning Spares and consumables

As part of the main equipment supply, the bidder shall supply all commissioning spares and consumables required during Start-up,

5.2 Mandatory Spares

The bidder shall offer along with main offer, the Mandatory Spares as specified in Volume IIB Section-C of the specification. The Mandatory Spares offered shall be of the same make and type as the main equipment.

5.3 Recommended Spares

The bidder shall furnish a list of Recommended Spares along with the normal service expectancy period and frequency of replacement; quantities recommended for 3 years operation along with unit rate against each item to enable BHEL / BHEL's Customer to place a separate order later, if required.

5.4 Special Tools & Tackles

The bidder shall furnish a list of Special Tools & Tackles included in the bid.

6.0 DRAWINGS AND DOCUMENTS

6.1 The bidder shall furnish the following documents in required number of copies along with the bid:

6.1.1 Data sheet-B, completely filled-up along with all enclosures.

6.1.2 Wiring diagrams for Electrical Actuators.

6.1.3 Hook up diagrams of Control Valve with Actuator & accessories.

6.1.4 Valve & actuator assembly dimensional drawings with weights.

6.1.5 Quality Plan

6.1.6 All relevant Catalogs with detailed technical information.

6.1.7 Bar-chart to indicate the time schedule for procurement, manufacture, testing and despatch.

6.2 The successful bidder shall furnish the following documents in required number of copies to BHEL during the contract stage:

6.2.1 For approval

i) Dimensional drawings.

ii) Installation drawings with overall dimensions of the completed equipment and clearances for operation and maintenance.

iii) Data sheet-C, completely filled-up along with all the enclosures including the sizing calculations & noise calculations.

iv) Quality Plan.

v) Test Certificates.



SPECIFICATION FOR CONTROL VALVE (WITH PNEUMATIC / ELECTRIC ACTUATOR)

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6.2.2 Final / As-built Drawings

Final / As-built drawings / CDs in required number of copies shall be submitted.

6.3 Operation & Maintenance Manuals

O&M Manuals in required number of copies shall be submitted. O&M manuals shall also contain storage and commissioning instructions.

7.0 MARKING AND PACKING

7.1 Marking

A stainless steel metal nameplate should be permanently fixed on each equipment giving its tag number and technical specifications.

7.2 Packing

All equipment / materials shall be suitably packed and protected for the entire period of dispatch, storage and erection against impact, abrasion, corrosion, incidental damage due to vermin, sunlight, high temperature, rain, moisture, humidity, dust, sea water spray (where applicable) as well as rough handling and delays in transit and storage in open.

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8.0 APPLICABLE DATA SHEET FORMS

This document shall be read with one or more of the following data sheet forms :

- | | |
|---|----------------------------|
| - Data sheet A&B for Control Valve with Pneumatic Actuator :
DS1-1 | Data sheet no. PES-145-06- |
| - Data sheet C for Control Valve with Pneumatic Actuator :
DS2-1 | Data sheet no. PES-145-06- |
| - Data sheet A&B for Control Valve with Electric Actuator :
DS3-1 | Data sheet no. PES-145-06- |
| - Data sheet C for Control Valve with Electric Actuator :
DS4-1 | Data sheet no. PES-145-06- |



SPECIFICATION FOR CONTROL VALVE (WITH PNEUMATIC / ELECTRIC ACTUATOR)

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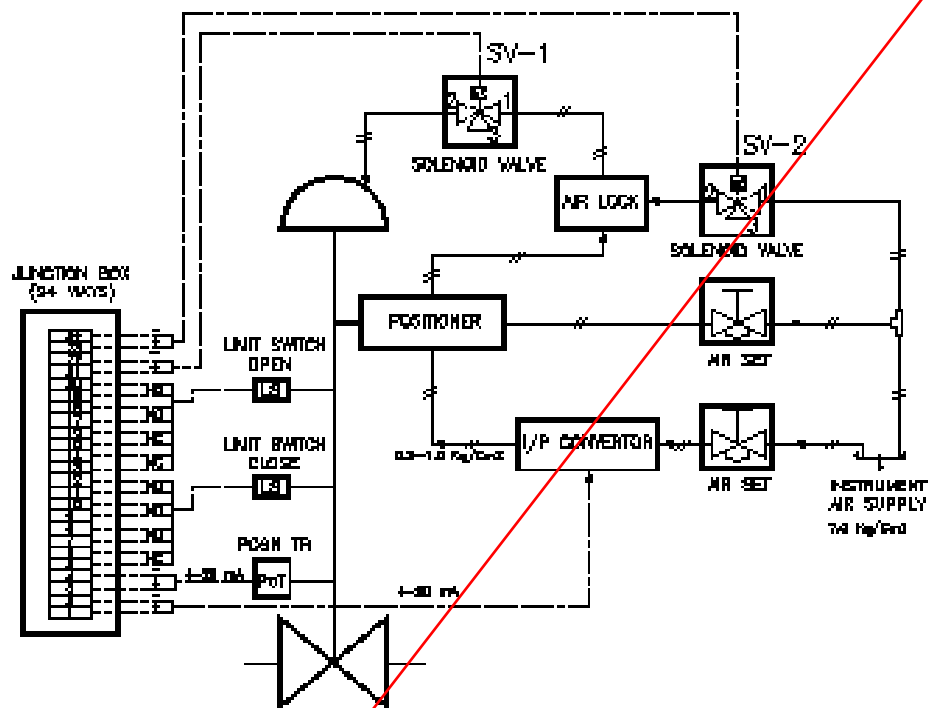
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NOTES:-

1. SOLENOID VALVE SV-1 WILL BE PROVIDED, IF SPECIFIED IN DATA SHEETS, FOR OVER-RIDING THE CONTROLLER SIGNAL.
2. SOLENOID VALVE SV-2 WILL BE PROVIDED, IF SPECIFIED IN DATA SHEET, FOR VALVE STOP/PUT POSITION REQUIREMENT ON CONTROLLER SIGNAL FAILURE.
3. SOLENOID VALVES PORT CONDITION
 PORT 1 AND 2 SHALL BE CONNECTED UNDER DE-ENERGISED CONDITION.
 PORT 2 AND 3 SHALL BE CONNECTED UNDER ENERGISED CONDITION.
4. FOR ON/OFF DUTY PNEUMATIC CONTROL VALVE THE FOLLOWING ACCESSORIES SHALL NOT BE APPLICABLE:-
 1. POSITIONER
 2. POSITION TRANSMITTER
 3. I/P CONVERTER
 4. AIR LOCK



SPECIFICATION FOR MICROPROCESSOR BASED ELECTRONIC POSITIONER (SMART)

SPECIFICATION NO.: PE-TS-381-145-I004

VOLUME

SECTION

REV. NO.

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1.0 Electrical :

Input Signal	4-20mA
Power Supply	Loop Powered from the output card of Control System (12-30 V DC)
Hart Protocol	Compatibility for Remote Calibration & Diagnostic (Super-Imposed HART Signal on Input Signal to positioner (4-20mA)
Valve Position Feedback	4-20mA output signal for Position Feedback is to be provided to control system.

2.0 Environment :

Operating Temperature	(-) 30 To 80 Deg.C
Humidity	0-95%
Protection Class	IP-65 (Minimum)

3.0 Diagnostic Features :

Diagnostic / Test Features (to be available in Smart Positioner and shall be accessible through any HMS software)	Minimum Diagnostic Features Like <ul style="list-style-type: none"> • Measurement of Valve positioning timing, • Detection of actuator leakage, • Display of fault alarm. • Logging of alarms and history. • Valve friction/jamming detection. • Detection of valve wear & tear, • Valve stroke length and timing.
	Advanced Diagnostic Features Like (OPTIONAL) <ul style="list-style-type: none"> • On line partial closure test. • Valve signature analysis (online graphical/tabular representation of input signal Vs valve travel). • Step response test.

4.0 Software :

Software (to be supplied alongwith smart positioner)	<ul style="list-style-type: none"> • Windows based software to meet the requirement for configuration, diagnostics, calibration and testing of Valve and actuator. • Easily up-gradable with same hardware and compatible with any Hart Management Systems (HMS). • Shall be capable to cater to all the tags in the specification at the same time without change in wiring.
--	--



SPECIFICATION FOR MICROPROCESSOR BASED ELECTRONIC POSITIONER (SMART)

SPECIFICATION NO.:PE-TS-338/341-145-I 004

VOLUME

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DATE : 30.09.2009

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5.0 Hardware :

Hardware (As required)	1. PC with software for configuring and accessing diagnostic features of the positioners.
	2. Multiplexers for interfacing smart positioner with PC.
	3. Communication cable for interconnecting multiplexers with PC.
	4. RS232/RS485 converter (if required)

Note : Power supply for Multiplexer shall be arranged by the owner.

6.0 Valve Action :

Valve Action	Direct & Reverse. (Same positioner for Single Acting or Double Acting And no separate relays required for changing from Single acting to double).
	During Failure of input Electrical signal (4-20 mA), valve to attain fail Freeze position without any external hardware. (Sol valve, Power Supply etc.)

7.0 Flow Characterization :

Flow Characterization	Possible to fit valve characteristic curve linear & Equal percentage
------------------------------	--

8.0 Performance:

Characteristic Deviation	$\leq 0.75\%$ of span
Ambient temp effect	$\leq 0.01\%$ / Deg C or better.
Dead Band	Adjustable 0.1 to 10%.
Scan Time	10ms
Resolution	$\leq 0.05\%$
Sensitivity/Linearity	0.3-0.4% of FS
Repeatability	0.32% of FS

9.0 Test Certificates:

Test Certificates/Test Reports for degree of protection, Accuracy and calibration test (as a minimum) to be submitted as per Manufacture Standard / Relevant Standard.

10.0 EMC & CE compliance

International Standard Like EN/IEC.

To EN 50081-2 & EN 50082 or equivalent



**SPECIFICATION FOR MICROPROCESSOR BASED
ELECTRONIC POSITIONER (SMART)**

SPECIFICATION NO.: PE-TS-338/341-145-I 004

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11.0 Accessories

In Built Operator Panel	Display with push buttons for Configuration and display on the positioner itself
Hand Held Hart Calibrator	Universal Hart Calibrator To Be Provided, One Per Unit.
Press Gauge Block	For Supply & Output Pr., Filter Regulator Other Accessories Shall Be Provided As per Control valve hook-up diagram.
Electrical cable entry	½ - NPT, side or bottom entry to avoid water Ingress.



**DATA SHEET FOR CONTROL VALVES
(WITH PNEUMATIC ACTUATOR)
For
SCCL - 2X600 MW SINGARENI TPP**

SPEC. NO.: PE-TS-381-142-N101

VOLUME II - B

SECTION D 1

REV. NO. 0

DATE : 25.07.2012

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**DATA SHEETS- A&B
FOR CONTROL VALVES**



**DATA SHEET FOR CONTROL VALVES
(WITH PNEUMATIC ACTUATOR)
For
SCCL - 2X600 MW SINGARENI TPP**

SPECIFICATION NO.: PE-TS-381-142-N101

VOLUME II - B

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Control Valve datasheets for

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3.	FDV-53 & FDV-58	PRESSURE CONTROL VALVE TO HIGH TEMP. DESUPERHEATER (DESH-1)	7-8
4.	FDV-54 & FDV-59	TEMP. CONTROL VALVE TO HIGH TEMP. DESUPERHEATER (DESH-1)	9-10
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Tag No.: **ASV-22**

Qty.: **ONE PER UNIT (02 Nos for 02 units)**

Data Sheet No. PES-145-06-DS1-0

DATA SHEET – A & B

DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)
(TO BE FILLED BY PURCHASER)

DATA SHEET – B
(TO BE FILLED UP BY
BIDDER)

GENERAL*	PROJECT SERVICE LOCATION DUTY PIPE SIZE (inlet / outlet) PIPE MATERIAL (inlet / outlet)	2X600 MW SINGARENI MAIN STEAM TO AUXILIARY STEAM PR. REDUCING CUM DESUPERHATING VALVE (HC- PRDS) [•] INDOOR [] OUTDOOR [] ON/OFF [•] MODULATING Ø 219.1 x 25 | Ø 355.6 x 9.53 SA 335 P91 | SA 335 P22	.........................|.....
BODY*	MODEL NO. TYPE OF BODY: GUIDING : NO. OF PORTS BODY SIZE: PORT SIZE: DESIGN CV END CONNECTION & RATING (ANSI) BODY MATERIAL PACKING: MATERIAL SINGLE / DOUBLE BONNET TYPE TRIM FORM TRIM MATERIAL: SEAT | PLUG : CAGE | GUIDE BUSH FLOW OUTLET VELOCITY REQUIRED LEAKAGE CLASS NOISE LEVEL (dBA) (spec. 3.1.14) VACUUM SERVICE ANTI CAVITATION TRIM	BIDDER TO SPECIFY [] GLOBE [•] ANGLE [] TOP [•] CAGE | ONE [•] BWE [] SWE [] FLANGED [•] A217 WC12A [] A217 WC9 [] SS [] A217 C5 [] A351 CF8M [] PTFE [•] GRAFOIL [] DOUBLE [•] SINGLE [] STD [] EXTENDED [] FINNED [] LINEAR [•] EQ. PERCENTAGE [] QUICK OPEN (ON/OFF) SS316 ST | SS316 ST SS316 ST | SS316 ST [] BELOW SEAT [] ABOVE SEAT [] < 7 M/SEC (WATER) | [•] MAC NO. < 1/3 (STM) [] II [] III [] IV [•] V [] VI LESS THAN 85 dBA [] YES [•] NO [] YES [•] NO	..........|.....|.....|..........|.....|.............................................|..........|....................|.........................|..........
PNEUMATIC ACTUATOR	MODEL NO. & SIZE CLOSE AT : OPEN AT (KG/CM2g) *TRAVEL TIME FOR OPEN TO CLOSE AND CLOSE TO OPEN } *VALVE POSN. ON SIGNAL AIR FAILURE *VALVE POSN. ON SUPPLY AIR FAILURE	PISTON TYPE ACTUATOR 1.0 | 0.2 LESS THAN 10 SECS. [] TO OPEN [] STAYPUT [•] TO CLOSE [•] STAYPUT	.....|..........|.........................
ACCESSORIES	POSITIONER (SMART) AIR FILTER REGULATOR AIR LOCK RELAY POSITION LIMIT SWITCH POSITION TRANSMITTER SOLENOID VALVE E/P CONVERTOR JUNCTION BOX HAND WHEEL (SIDE MOUNTED) LOCAL POSITION INDICATOR ELECTRO PNEUMATIC POSITIONER	[•] REQUIRED [] NOT REQUIRED [•] REQUIRED [] NOT REQUIRED [•] REQUIRED [] NOT REQUIRED [•] REQUIRED [] NOT REQUIRED PART OF SMART POSITIONER [] REQUIRED [•] NOT REQUIRED PART OF SMART POSITIONER [•] REQUIRED [] NOT REQUIRED [•] REQUIRED [•] REQUIRED [] REQUIRED [•] NOT REQUIRED	

SPECIFICATION NO.: PE-TS-381-142-N101

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RFV NO.

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Tag No.: **ASV-22**

Qty.: **ONE PER UNIT (02 Nos for 02 units)** Data Sheet No. PES-145-06-DS1-0

DATA SHEET – A & B

DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)
(TO BE FILLED BY PURCHASER)

DATA SHEET – B
(TO BE FILLED UP BY
BIDDER)

PERFORMANCE OF VALVE

LINEARITY
HYSTERESIS
SENSITIVITY
ACCURACY (OVERALL)

$\pm 2\%$
 $\pm 1\%$
 $\pm 0.5\%$
 $+ 2\%$

SERVICE CONDITION*

SL. No.	+
------------	---

LOAD

FLOW
(T/HR)

INLET PR.
KG/CM2(A)

OUTLET
PR.
KG/CM2(A)

TEMP
DEG (C)

CALCULATED
CV

% VALVE
LIFT

VALVE
O/L
VELOCITY

Refer Sizing Data Sheet A-1 for High capacity Aux. Steam PRDS ASV-22

VALVE TYPE

☐ CAVITATION ☐ FLASHING
☒ HIGH DP

* MAX SHUT OFF PRESS (KG/CM2g)	189.9
---------------------------------	-------

BODY DESIGN : PRESS (KG/CM2g) | TEMP (DEG C)	189.9	545
--	-------	-----

* IBR FORM III-C

☒ REQUIRED ☐ NOT REQUIRED

TOTAL WEIGHT (VALVE + ACTUATOR + ACCESSORIES) Kg

NOTES:

1. DESIGN C_v SHALL BE BASED ON SERVICE CONDITIONS INDICATED AS PER SPECIFICATION CLAUSE NUMBER 3.1.7. OF SPECIFICATION NO. : PES – 145 – 06 VOL. IIB SECTION D OF TECHNICAL SPECIFICATION



**DATA SHEET FOR CONTROL VALVES
(WITH PNEUMATIC ACTUATOR)
For
SCCL - 2X600 MW SINGARENI TPP**

SPECIFICATION NO.: PE-TS-381-142-N101

VOLUME II - B

SECTION D

REV. NO.

0

DATE : 25.07.2012

SHEET

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OF

17

Tag No.: **ASV-65**Qty.: **ONE PER UNIT (02 Nos for 02 units)**

Data Sheet No. PES-145-06-DS1-0

DATA SHEET – A & B

**DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)
(TO BE FILLED BY PURCHASER)**

**DATA SHEET – B
(TO BE FILLED UP BY
BIDDER)**

GENERAL *	PROJECT SERVICE	2X600 MW SINGARENI COLD REHEAT STEAM TO AUXILIARY STEAM PR. REDUCING VALVE (LC PRV)	.....
	LOCATION	<input type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR	.....
BODY *	DUTY	<input type="checkbox"/> ON/OFF <input type="checkbox"/> MODULATING	.....
	PIPE SIZE (inlet / outlet)	Ø 114.3 x 6.02 | Ø 168.3 x 7.11	.....|.....
	PIPE MATERIAL (inlet / outlet)	SA 106 Gr. B | SA 106 Gr. B	.....|.....
	MODEL NO.	BIDDER TO SPECIFY	.....
	TYPE OF BODY: GUIDING : NO. OF PORTS	<input type="checkbox"/> GLOBE <input type="checkbox"/> ANGLE <input type="checkbox"/> TOP <input type="checkbox"/> CAGE <input type="checkbox"/> ONE	.....|.....|.....
	BODY SIZE: PORT SIZE: DESIGN CV		.....|.....|.....
	END CONNECTION & RATING (ANSI)	<input type="checkbox"/> BWE <input type="checkbox"/> SWE <input type="checkbox"/> FLANGED	.....
	BODY MATERIAL	<input type="checkbox"/> A216 WCB <input type="checkbox"/> A217 WC9 <input type="checkbox"/> SS <input type="checkbox"/> A217 C5 <input type="checkbox"/> A351 CF8M	.....
	PACKING: MATERIAL SINGLE / DOUBLE	<input type="checkbox"/> PTFE <input type="checkbox"/> GRAFOIL <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE	.....
	BONNET TYPE	<input type="checkbox"/> STD <input type="checkbox"/> EXTENDED <input type="checkbox"/> FINNED	.....
TRIM FORM	<input type="checkbox"/> LINEAR <input type="checkbox"/> EQ. PERCENTAGE	.....
TRIM MATERIAL: SEAT | PLUG	SS316 ST | SS316 ST	.....|.....
: CAGE | GUIDE BUSH	SS316 ST | SS316 ST	.....|.....
FLOW	<input type="checkbox"/> BELOW SEAT <input type="checkbox"/> ABOVE SEAT	.....
OUTLET VELOCITY	<input type="checkbox"/> < 7 M/SEC (WATER) <input type="checkbox"/> MAC NO. < 1/3 (STM)	.....|.....
REQUIRED LEAKAGE CLASS	<input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> VI	.....
NOISE LEVEL (dBA) (spec. 3.1.14)	LESS THAN 85 dBA	.....
VACUUM SERVICE	<input type="checkbox"/> YES <input type="checkbox"/> NO	.....
ANTI CAVITATION TRIM	<input type="checkbox"/> YES <input type="checkbox"/> NO	.....
PNEUMATIC ACTUATOR	MODEL NO. & SIZE	BIDDER TO SPECIFY	.....|.....
	CLOSE AT : OPEN AT (KG/CM2g)	1.0 | 0.2	.....|.....
ACCESSORIES	*TRAVEL TIME FOR OPEN TO CLOSE AND CLOSE TO OPEN	LESS THAN 10 SECS.	.....
	*VALVE POSN. ON SIGNAL AIR FAILURE	<input type="checkbox"/> TO OPEN <input type="checkbox"/> STAYPUT <input type="checkbox"/> TO CLOSE	.....
	*VALVE POSN. ON SUPPLY AIR FAILURE	<input type="checkbox"/> STAYPUT	.....
ACCESSORIES	POSITIONER (SMART)	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	AIR FILTER REGULATOR	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	AIR LOCK RELAY	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	POSITION LIMIT SWITCH	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	POSITION TRANSMITTER	PART OF SMART POSITIONER	
	SOLENOID VALVE	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	E/P CONVERTOR	PART OF SMART POSITIONER	
	JUNCTION BOX	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	HAND WHEEL (SIDE MOUNTED)	<input type="checkbox"/> REQUIRED	
	LOCAL POSITION INDICATOR	<input type="checkbox"/> REQUIRED	
ELECTRO PNEUMATIC POSITIONER	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED		

SPECIFICATION NO.: PE-TS-381-142-N101

VOLUME II - B

SECTION D

REV. NO.

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SHEET

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Qty.: **ONE PER UNIT (02 Nos for 02 units)** Data Sheet No. PES-145-06-DS1-0

DATA SHEET – A & B

DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)
(TO BE FILLED BY PURCHASER)

DATA SHEET – B
(TO BE FILLED UP BY
BIDDER)

PERFORMANCE OF VALVE

LINEARITY
HYSTERESIS
SENSITIVITY
ACCURACY (OVERALL)

$\pm 2\%$
 $\pm 1\%$
 $\pm 0.5\%$
 $+ 2\%$

SL. No.	+
------------	---

LOAD

FLOW
(T/HR)

INLET PR.
KG/CM2(A)

OUTLET
PR.
KG/CM2(A)

TEMP
DEG (C)

CALCULATED
CV

% VALVE
LIFT

VALVE
O/L
VELOCITY

SERVICE CONDITION*

**Refer Sizing Data Sheet A-2 for Aux. Steam PRDS Low Capacity
Pressure Reducing Valve ASV-65**

VALVE TYPE

☐ CAVITATION ☐ FLASHING
☒ HIGH DP

* MAX SHUT OFF PRESS (KG/CM²g)

55

BODY DESIGN : PRESS (KG/CM2g) | TEMP (DEG C) 55 | 360

* IBR FORM III-C

[•] REQUIRED [] NOT REQUIRED

TOTAL WEIGHT (VALVE + ACTUATOR + ACCESSORIES) Kg

NOTES:

1. DESIGN C_v SHALL BE BASED ON SERVICE CONDITIONS INDICATED AS PER SPECIFICATION CLAUSE NUMBER 3.1.7. OF SPECIFICATION NO. : PES – 145 – 06 VOL IIB SECTION D OF TECHNICAL SPECIFICATION



**DATA SHEET FOR CONTROL VALVES
(WITH PNEUMATIC ACTUATOR)
For
SCCL - 2X600 MW SINGARENI TPP**

SPECIFICATION NO.: PE-TS-381-142-N101

VOLUME II - B

SECTION D

REV. NO.

0

DATE : 25.07.2012

SHEET

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OF

17

Tag No.: **FDV-53 & FDV-58** Qty.: **ONE EACH PER UNIT (04 Nos. for 02 units)** Data Sheet No. PES-145-06-DS1-0**DATA SHEET – A & B**

DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR) (TO BE FILLED BY PURCHASER)			DATA SHEET – B (TO BE FILLED UP BY BIDDER)
GENERAL*	PROJECT	2X600 MW SINGARENI	.....
	SERVICE	SPRAY TO COMBINED PRDS PRESSURE	.....
BODY*	LOCATION	CONTROL VALVE	.....
	DUTY	<input type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR	.....
	PIPE SIZE (inlet / outlet)	<input type="checkbox"/> ON/OFF <input type="checkbox"/> MODULATING	.....
	PIPE MATERIAL (inlet / outlet)	Ø 60.3 x11.07 | Ø 60.3 x11.07	.....
		SA 106 Gr. C | SA 106 Gr. C	.....
	MODEL NO.	BIDDER TO SPECIFY	.....
	TYPE OF BODY: GUIDING : NO. OF PORTS	<input type="checkbox"/> GLOBE <input type="checkbox"/> ANGLE <input type="checkbox"/> TOP <input type="checkbox"/> CAGE <input type="checkbox"/> ONE	.....
	BODY SIZE: PORT SIZE: DESIGN CV		.....
	END CONNECTION & RATING (ANSI)	<input type="checkbox"/> BWE <input type="checkbox"/> SWE <input type="checkbox"/> FLANGED	.....
	BODY MATERIAL	<input type="checkbox"/> A216 WCB <input type="checkbox"/> A217 WC6 <input type="checkbox"/> SS <input type="checkbox"/> A217 C5	.....
PACKING: MATERIAL SINGLE / DOUBLE	<input type="checkbox"/> A351 CF8M	.....
BONNET TYPE	<input type="checkbox"/> PTFE <input type="checkbox"/> GRAFOIL <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE	.....
TRIM FORM	<input type="checkbox"/> STD <input type="checkbox"/> EXTENDED <input type="checkbox"/> FINNED	.....
TRIM MATERIAL: SEAT | PLUG	<input type="checkbox"/> LINEAR <input type="checkbox"/> EQ. PERCENTAGE	.....
: CAGE | GUIDE BUSH	<input type="checkbox"/> QUICK OPEN (ON/OFF)	.....
FLOW	17-4 PH SS | 17-4 PH SS	.....
OUTLET VELOCITY	17-4 PH SS | 17-4 PH SS	.....
REQUIRED LEAKAGE CLASS	<input type="checkbox"/> BELOW SEAT <input type="checkbox"/> ABOVE SEAT	.....
NOISE LEVEL (dBA) (spec. 3.1.14)	<input type="checkbox"/> < 7 M/SEC (WATER) <input type="checkbox"/> MAC NO < 1/3	.....
VACUUM SERVICE	(STM)	.....
ANTI CAVITATION TRIM	<input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> VI	.....
	LESS THAN 85 dBA	.....
	<input type="checkbox"/> YES <input type="checkbox"/> NO	.....
	<input type="checkbox"/> YES <input type="checkbox"/> NO	.....
PNEUMATIC ACTUATOR	MODEL NO. & SIZE	BIDDER TO SPECIFY	.....
	CLOSE AT : OPEN AT (KG/CM ² g)	0.2 | 1.0	.....
ACCESSORIES	*TRAVEL TIME FOR OPEN TO CLOSE } AND CLOSE TO OPEN	LESS THAN 10 SECS.	.....
	*VALVE POSN. ON SIGNAL AIR FAILURE	<input type="checkbox"/> TO OPEN <input type="checkbox"/> STAYPUT <input type="checkbox"/> TO CLOSE	.....
	*VALVE POSN. ON SUPPLY AIR FAILURE	<input type="checkbox"/> STAYPUT	.....
ACCESSORIES	POSITIONER (SMART)	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	AIR FILTER REGULATOR	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	AIR LOCK RELAY	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	POSITION LIMIT SWITCH	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	POSITION TRANSMITTER	PART OF SMART POSITIONER	
	SOLENOID VALVE	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	E/P CONVERTOR	PART OF SMART POSITIONER	
	JUNCTION BOX	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	HAND WHEEL (SIDE MOUNTED)	<input type="checkbox"/> REQUIRED	
	LOCAL POSITION INDICATOR	<input type="checkbox"/> REQUIRED	
ELECTRO PNEUMATIC POSITIONER	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED		

SPECIFICATION NO.: PE-TS-381-142-N101

VOLUME II - B

SECTION D

REV. NO.

0

DATE : 25.07.2012

SHEET

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Tag No.: **FDV-53 & FDV-58** Qty.: **ONE EACH PER UNIT (04 Nos. for 02 units)** Data Sheet No. PES-145-06-DS1-0

DATA SHEET – A & B

DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)
(TO BE FILLED BY PURCHASER)

DATA SHEET – B
(TO BE FILLED UP BY
BIDDER)

PERFORMANCE OF VALVE

LINEARITY
HYSTERESIS
SENSITIVITY
ACCURACY (OVERALL)

$\pm 2\%$
$\pm 1\%$
$\pm 0.5\%$
$+ 2\%$

SL.
No. +

LOAD

FLOW
(T/HR)

INLET PR.
KG/CM2(A)

OUTLET
PR.
KG/CM2(A)

TEMP
DEG (C)

CALCULATED
CV

% VALVE
LIFT

VALVE
O/L
VELOCITY

SERVICE
CONDITION*

Refer Sizing Data Sheet A-1 for High Capacity PRDS

VALVE TYPE

☒ CAVITATION ☐ FLASHING

[•] HIGH DP

* MAX SHUT OFF PRESS (KG/CM2g)

336

* BODY DESIGN : PRESS (KG/CM2g) | TEMP (DEG C)	336	180
--	-----	------------

* IBR FORM III-C

[•] REQUIRED [□] NOT REQUIRED

TOTAL WEIGHT (VALVE + ACTUATOR + ACCESSORIES) Kg

NOTES:

1. DESIGN C_v SHALL BE BASED ON SERVICE CONDITIONS INDICATED AS PER SPECIFICATION CLAUSE NUMBER 3.1.7. OF SPECIFICATION NO. : PES – 145 – 06 VOL IIB SECTION D OF TECHNICAL SPECIFICATION

SPECIFICATION NO.: PE-TS-381-142-N101

VOLUME II - B

SECTION D

REV. NO. _____

0

DATE : 25.07.2012

SHEET

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O

17

Tag No.: **FDV-54 & FDV-59** Qty.: **ONE EACH PER UNIT (04 Nos. for 02 units)** Data Sheet No. PES-145-06-DS1-0

DATA SHEET – A & B

DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)
(TO BE FILLED BY PURCHASER)

DATA SHEET – B
(TO BE FILLED UP BY
BIDDER)

PERFORMANCE OF VALVE

LINEARITY
HYSTERESIS
SENSITIVITY
ACCURACY (OVERALL)

$\pm 2\%$
$\pm 1\%$
$\pm 0.5\%$
$+ 2\%$

.....

.....

.....

SERVICE
CONDITION*

SL.
No. +

LOAD

FLOW
(T/HR)

INLET PR.
KG/CM2(A)

OUTLET
PR.
KG/CM2(A)

TEMP
DEG (C)

CALCULATED
CV

VALVE LIFT	VALVE LIFT		VALVE LIFT
	VALVE LIFT	VALVE LIFT	
0.00	0.00	0.00	0.00
0.05	0.05	0.05	0.05
0.10	0.10	0.10	0.10
0.15	0.15	0.15	0.15
0.20	0.20	0.20	0.20
0.25	0.25	0.25	0.25
0.30	0.30	0.30	0.30
0.35	0.35	0.35	0.35
0.40	0.40	0.40	0.40
0.45	0.45	0.45	0.45
0.50	0.50	0.50	0.50
0.55	0.55	0.55	0.55
0.60	0.60	0.60	0.60
0.65	0.65	0.65	0.65
0.70	0.70	0.70	0.70
0.75	0.75	0.75	0.75
0.80	0.80	0.80	0.80
0.85	0.85	0.85	0.85
0.90	0.90	0.90	0.90
0.95	0.95	0.95	0.95
1.00	1.00	1.00	1.00

VALVE
O/L
VELOCITY

Refer Sizing Data Sheet A-1 for High Capacity PRDS

VALVE TYPE

☒ CAVITATION ☐ FLASHING

[•] HIGH DP

* MAX SHUT OFF PRESS (KG/CM2g)	336
* BODY DESIGN : PRESS (KG/CM2g) | TEMP (DEG C)	336 | 180
* IBR FORM III-C	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED

TOTAL WEIGHT (VALVE + ACTUATOR + ACCESSORIES) Kg

.....

NOTES:

1. DESIGN C_v SHALL BE BASED ON SERVICE CONDITIONS INDICATED AS PER SPECIFICATION CLAUSE NUMBER 3.1.7. OF SPECIFICATION NO. : PES – 145 – 06 VOL IIB SECTION D OF TECHNICAL SPECIFICATION



**DATA SHEET FOR CONTROL VALVES
(WITH PNEUMATIC ACTUATOR)
For
SCCL - 2X600 MW SINGARENI TPP**

SPECIFICATION NO.: PE-TS-381-142-N101

VOLUME II - B

SECTION D

REV. NO.

0

DATE : 25.07.2012

SHEET

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OF

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Tag No.: **FDV-62 & FDV-67** Qty.: **ONE EACH PER UNIT (04 Nos. for 02 units)** Data Sheet No. PES-145-06-DS1-0**DATA SHEET – A & B**

**DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)
(TO BE FILLED BY PURCHASER)**

**DATA SHEET – B
(TO BE FILLED UP BY
BIDDER)**

GENERAL*	PROJECT	2X600 MW SINGARENI
	SERVICE	SPRAY TO LT DESH PRESSURE CONTROL VALVE
BODY*	LOCATION	<input type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR
	DUTY	<input type="checkbox"/> ON/OFF <input type="checkbox"/> MODULATING
	PIPE SIZE (inlet / outlet)	Ø 48.3 x10.15 | Ø 48.3 x10.15
	PIPE MATERIAL (inlet / outlet)	SA 106 Gr. C | SA 106 Gr. C
	MODEL NO.	BIDDER TO SPECIFY
	TYPE OF BODY: GUIDING : NO. OF PORTS	<input type="checkbox"/> GLOBE <input type="checkbox"/> ANGLE <input type="checkbox"/> TOP <input type="checkbox"/> CAGE <input type="checkbox"/> ONE
	BODY SIZE: PORT SIZE: DESIGN CV	
	END CONNECTION & RATING (ANSI)	<input type="checkbox"/> BWE <input type="checkbox"/> SWE <input type="checkbox"/> FLANGED
	BODY MATERIAL	<input type="checkbox"/> A216 WCB <input type="checkbox"/> A217 WC6 <input type="checkbox"/> SS <input type="checkbox"/> A217 C5
	PACKING: MATERIAL SINGLE / DOUBLE	<input type="checkbox"/> A351 CF8M
BONNET TYPE	<input type="checkbox"/> PTFE <input type="checkbox"/> GRAFOIL <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE	.....
TRIM FORM	<input type="checkbox"/> STD <input type="checkbox"/> EXTENDED <input type="checkbox"/> FINNED	.....
TRIM MATERIAL: SEAT | PLUG	<input type="checkbox"/> LINEAR <input type="checkbox"/> EQ. PERCENTAGE	.....
: CAGE | GUIDE BUSH	<input type="checkbox"/> QUICK OPEN (ON/OFF)	.....
FLOW	17-4 PH SS | 17-4 PH SS	.....
OUTLET VELOCITY	17-4 PH SS | 17-4 PH SS	.....
REQUIRED LEAKAGE CLASS	<input type="checkbox"/> BELOW SEAT <input type="checkbox"/> ABOVE SEAT	.....
NOISE LEVEL (dBA) (spec. 3.1.14)	<input type="checkbox"/> < 7 M/SEC (WATER) <input type="checkbox"/> MAC NO < 1/3 (STM)	.....
VACUUM SERVICE	<input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> VI	.....
ANTI CAVITATION TRIM	LESS THAN 85 dBA	.....
PNEUMATIC ACTUATOR	MODEL NO. & SIZE	BIDDER TO SPECIFY
	CLOSE AT : OPEN AT (KG/CM ² g)	0.2 | 1.0
	*TRAVEL TIME FOR OPEN TO CLOSE } AND CLOSE TO OPEN	LESS THAN 10 SECS.
	*VALVE POSN. ON SIGNAL AIR FAILURE *VALVE POSN. ON SUPPLY AIR FAILURE	<input type="checkbox"/> TO OPEN <input type="checkbox"/> STAYPUT <input type="checkbox"/> TO CLOSE <input type="checkbox"/> STAYPUT
ACCESSORIES	POSITIONER (SMART)	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	AIR FILTER REGULATOR	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	AIR LOCK RELAY	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	POSITION LIMIT SWITCH	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	POSITION TRANSMITTER	PART OF SMART POSITIONER	
	SOLENOID VALVE	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	E/P CONVERTOR	PART OF SMART POSITIONER	
	JUNCTION BOX	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	HAND WHEEL (SIDE MOUNTED)	<input type="checkbox"/> REQUIRED	
	LOCAL POSITION INDICATOR	<input type="checkbox"/> REQUIRED	
	ELECTRO PNEUMATIC POSITIONER	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	

SPECIFICATION NO.: PE-TS-381-142-N101

VOLUME II - B

SECTION D

REV. NO.

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Tag No.: **FDV-62 & FDV-67** Qty.: **ONE EACH PER UNIT (04 Nos. for 02 units)** Data Sheet No. PES-145-06-DS1-0

DATA SHEET – A & B

DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)
(TO BE FILLED BY PURCHASER)

DATA SHEET – B
(TO BE FILLED UP BY
BIDDER)

PERFORMANCE OF VALVE

LINEARITY
HYSTERISIS
SENSITIVITY
ACCURACY (OVERALL)

$\pm 2\%$
 $\pm 1\%$
 $\pm 0.5\%$
 $+ 2\%$

SERVICE
CONDITION*

SL.
No. +

LOAD

FLOW
(T/HR)

INLET PR.
KG/CM2(A)

OUTLET
PR.
KG/CM2(A)

TEMP
DEG (C)

CALCULATED
CV

% VALVE
LIFT

VALVE
O/L
VELOCITY

Refer Sizing Data Sheet A-3 for Low Capacity PRDS

VALVE TYPE

☒ CAVITATION ☐ FLASHING

[•] HIGH DP

* MAX SHUT OFF PRESS (KG/CM2g)

336

* BODY DESIGN : PRESS (KG/CM2g) | TEMP (DEG C)	336	180
--	-----	-----

* IBR FORM III-C

[•] REQUIRED [□] NOT REQUIRED

TOTAL WEIGHT (VALVE + ACTUATOR + ACCESSORIES) Kg

NOTES:

1. DESIGN C_v SHALL BE BASED ON SERVICE CONDITIONS INDICATED AS PER SPECIFICATION CLAUSE NUMBER 3.1.7. OF SPECIFICATION NO. : PES – 145 – 06 VOL IIB SECTION D OF TECHNICAL SPECIFICATION



**DATA SHEET FOR CONTROL VALVES
(WITH PNEUMATIC ACTUATOR)
For
SCCL - 2X600 MW SINGARENI TPP**

SPECIFICATION NO.: PE-TS-381-142-N101

VOLUME II - B

SECTION D

REV. NO.

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DATE : 25.07.2012

SHEET

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Tag No.: **FDV-63 & FDV-68** Qty.: **ONE EACH PER UNIT (04 Nos. for 02 units)** Data Sheet No. PES-145-06-DS1-0

DATA SHEET – A & B

DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR) (TO BE FILLED BY PURCHASER)			DATA SHEET – B (TO BE FILLED UP BY BIDDER)
GENERAL *	PROJECT	2X600 MW SINGARENI
	SERVICE	SPRAY TO LT DESH TEMP. CONTROL VALVE
BODY *	LOCATION	<input type="checkbox"/> INDOOR <input type="checkbox"/> OUTDOOR
	DUTY	<input type="checkbox"/> ON/OFF <input type="checkbox"/> MODULATING
	PIPE SIZE (inlet / outlet)	Ø 48.3 x10.15 | Ø 48.3 x10.15
	PIPE MATERIAL (inlet / outlet)	SA 106 Gr. C | SA 106 Gr. C
	MODEL NO.	BIDDER TO SPECIFY
	TYPE OF BODY: GUIDING : NO. OF PORTS	<input type="checkbox"/> GLOBE <input type="checkbox"/> ANGLE <input type="checkbox"/> TOP <input type="checkbox"/> CAGE <input type="checkbox"/> ONE
	BODY SIZE: PORT SIZE: DESIGN CV	<input type="checkbox"/> BWE <input type="checkbox"/> SWE <input type="checkbox"/> FLANGED
	END CONNECTION & RATING (ANSI)	<input type="checkbox"/> A216 WCB <input type="checkbox"/> A217 WC6 <input type="checkbox"/> SS <input type="checkbox"/> A217 C5
	BODY MATERIAL	<input type="checkbox"/> A351 CF8M
	PACKING: MATERIAL SINGLE / DOUBLE	<input type="checkbox"/> PTFE <input type="checkbox"/> GRAFOIL <input type="checkbox"/> DOUBLE <input type="checkbox"/> SINGLE
BONNET TYPE	<input type="checkbox"/> STD <input type="checkbox"/> EXTENDED <input type="checkbox"/> FINNED	.....
TRIM FORM	<input type="checkbox"/> LINEAR <input type="checkbox"/> EQ. PERCENTAGE	.....
TRIM MATERIAL: SEAT | PLUG	<input type="checkbox"/> QUICK OPEN (ON/OFF)	.....
: CAGE | GUIDE BUSH	17-4 PH SS | 17-4 PH SS	.....
FLOW	17-4 PH SS | 17-4 PH SS	.....
OUTLET VELOCITY	<input type="checkbox"/> BELOW SEAT <input type="checkbox"/> ABOVE SEAT	.....
REQUIRED LEAKAGE CLASS	<input type="checkbox"/> < 7 M/SEC (WATER) <input type="checkbox"/> MAC NO < 1/3 (STM)	.....
NOISE LEVEL (dBA) (spec. 3.1.14)	<input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> VI	.....
VACUUM SERVICE	LESS THAN 85 dBA	.....
ANTI CAVITATION TRIM	<input type="checkbox"/> YES <input type="checkbox"/> NO	.....
PNEUMATIC ACTUATOR	MODEL NO. & SIZE	BIDDER TO SPECIFY
	CLOSE AT : OPEN AT (KG/CM2g)	0.2 | 1.0
	*TRAVEL TIME FOR OPEN TO CLOSE AND CLOSE TO OPEN	LESS THAN 10 SECS.
*VALVE POSN. ON SIGNAL AIR FAILURE	<input type="checkbox"/> TO OPEN <input type="checkbox"/> STAYPUT <input type="checkbox"/> TO CLOSE	.....
*VALVE POSN. ON SUPPLY AIR FAILURE	<input type="checkbox"/> STAYPUT	.....
ACCESSORIES	POSITIONER (SMART)	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	AIR FILTER REGULATOR	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	AIR LOCK RELAY	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	POSITION LIMIT SWITCH	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	POSITION TRANSMITTER	PART OF SMART POSITIONER	
	SOLENOID VALVE	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	E/P CONVERTOR	PART OF SMART POSITIONER	
	JUNCTION BOX	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	
	HAND WHEEL (SIDE MOUNTED)	<input type="checkbox"/> REQUIRED	
	LOCAL POSITION INDICATOR	<input type="checkbox"/> REQUIRED	
	ELECTRO PNEUMATIC POSITIONER	<input type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED	

SPECIFICATION NO.: PE-TS-381-142-N101

VOLUME II - B

SECTION D

REV. NO. _____

0

DATE : 25.07.2012

SHEET

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OF

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Tag No.: **FDV-63 & FDV-68** Qty.: **ONE EACH PER UNIT (04 Nos. for 02 units)** Data Sheet No. PES-145-06-DS1-0

DATA SHEET – A & B

DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)
(TO BE FILLED BY PURCHASER)

DATA SHEET – B
(TO BE FILLED UP BY
BIDDER)

PERFORMANCE OF VALVE

LINEARITY
HYSTERESIS
SENSITIVITY
ACCURACY (OVERALL)

$\pm 2\%$
$\pm 1\%$
$\pm 0.5\%$
$+ 2\%$

SERVICE
CONDITION*

SL.
No. +

LOAD

FLOW
(T/HR)

INLET PR.
KG/CM2(A)

OUTLET
PR.
KG/CM2(A)

TEMP
DEG (C)

CALCULATED
CV

% VALVE
LIFT

VALVE
O/L
VELOCITY

Refer Sizing Data Sheet A-3 for Low Capacity PRDS

VALVE TYPE

☒ CAVITATION ☐ FLASHING

[•] HIGH DP

* MAX SHUT OFF PRESS (KG/CM2g)

336

* BODY DESIGN : PRESS (KG/CM2g) | TEMP (DEG C)	336	180
--	-----	------------

* IBR FORM III-C

☒ REQUIRED ☐ NOT REQUIRED

TOTAL WEIGHT (VALVE + ACTUATOR + ACCESSORIES) Kg

NOTES:

1. DESIGN C_v SHALL BE BASED ON SERVICE CONDITIONS INDICATED AS PER SPECIFICATION CLAUSE NUMBER 3.1.7. OF SPECIFICATION NO. : PES – 145 – 06 VOL IIB SECTION D OF TECHNICAL SPECIFICATION

SPECIFICATION NO.: PE-TS-381-142-N101		
VOLUME	II - B	
SECTION	D	
REV. NO.	0	DATE : 25.07.2012
SHEET	15	OF 17

Tag No.: **FDV-51** Qty.: **ONE PER UNIT (02 Nos. for 02 units)** Data Sheet No. PES-145-06-DS1-0

DATA SHEET – A & B

DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR) (TO BE FILLED BY PURCHASER)			DATA SHEET – B (TO BE FILLED UP BY BIDDER)
GENERAL*	PROJECT SERVICE	2X600 MW SINGARENI	.....
	LOCATION DUTY	BLOCK SPRAY VALVE [•] INDOOR [] OUTDOOR [•] ON/OFF [] MODULATING	.....
BODY*	PIPE SIZE (inlet / outlet)	Ø 88.9 x15.24 | Ø 88.9 x15.24	.....
	PIPE MATERIAL (inlet / outlet)	SA 106 Gr. C | SA 106 Gr. C	.....|.....
PNEUMATIC ACTUATOR	MODEL NO.	BIDDER TO SPECIFY	.....
	TYPE OF BODY: GUIDING : NO. OF PORTS	[•] GLOBE [] ANGLE [] TOP [•] CAGE [ONE	.....|.....|.....|.....
ACCESSORIES	BODY SIZE: PORT SIZE: DESIGN CV	.....	.....
	END CONNECTION & RATING (ANSI)	.....	.....
BODY*	BODY MATERIAL	.....	.....
	PACKING: MATERIAL SINGLE / DOUBLE	.....	.....
PNEUMATIC ACTUATOR	BONNET TYPE	.....	.....
	TRIM FORM	.....	.....
ACCESSORIES	TRIM MATERIAL: SEAT | PLUG	.....	.....
	: CAGE | GUIDE BUSH	.....	.....
PNEUMATIC ACTUATOR	FLOW	.....	.....
	OUTLET VELOCITY	.....	.....
ACCESSORIES	REQUIRED LEAKAGE CLASS	.....	.....
	NOISE LEVEL (dBA) (spec. 3.1.14)	.....	.....
PNEUMATIC ACTUATOR	VACUUM SERVICE	.....	.....
	ANTI CAVITATION TRIM	.....	.....
PNEUMATIC ACTUATOR	MODEL NO. & SIZE	BIDDER TO SPECIFY	.....|.....
	CLOSE AT : OPEN AT (KG/CM2g)	0.2 | 1.0	.....|.....
PNEUMATIC ACTUATOR	*TRAVEL TIME FOR OPEN TO CLOSE	.....	.....
	AND CLOSE TO OPEN	LESS THAN 10 SECS.	.....
PNEUMATIC ACTUATOR	*VALVE POSN. ON SIGNAL AIR FAILURE	.....	.....
	*VALVE POSN. ON SUPPLY AIR FAILURE	[•] TO OPEN [] STAYPUT [•] TO CLOSE [•] STAYPUT	.....
ACCESSORIES	POSITIONER (SMART)	.....	.....
	AIR FILTER REGULATOR	.....	.....
ACCESSORIES	AIR LOCK RELAY	.....	.....
	POSITION LIMIT SWITCH	.....	.....
ACCESSORIES	POSITION TRANSMITTER	.....	.....
	SOLENOID VALVE	.....	.....
ACCESSORIES	E/P CONVERTOR	.....	.....
	JUNCTION BOX	.....	.....
ACCESSORIES	HAND WHEEL (SIDE MOUNTED)	.....	.....
	LOCAL POSITION INDICATOR	.....	.....
ACCESSORIES	ELECTRO PNEUMATIC POSITIONER
	

SPECIFICATION NO.: PE-TS-381-142-N101

VOLUME II - B

SECTION D

REV. NO. _____

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DATE : 25.07.2012

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Tag No.: **FDV-51**

Qty.: **ONE PER UNIT (02 Nos. for 02 units)**

Data Sheet No. PES-145-06-DS1-0

DATA SHEET – A & B

DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)
(TO BE FILLED BY PURCHASER)

DATA SHEET – B
(TO BE FILLED UP BY
BIDDER)

PERFORMANCE OF VALVE

LINEARITY
HYSTERESIS
SENSITIVITY
ACCURACY (OVERALL)

$\pm 2\%$
$\pm 1\%$
$\pm 0.5\%$
$\pm 2\%$

.....

.....

.....

.....

SERVICE
CONDITION*

SL. No.	+
------------	---

LOAD

FLOW
(T/HR)

INLET PR.
KG/CM2(A)

OUTLET
PR.
KG/CM2(A)

TEMP
DEG (C)

CALCULATED
CV

% VALVE LIFT	
0	
10	
20	
30	
40	
50	
60	
70	
80	
90	
100	

VALVE	O/L	VELOCITY
1	0.00	0.00
2	0.00	0.00
3	0.00	0.00
4	0.00	0.00
5	0.00	0.00
6	0.00	0.00
7	0.00	0.00
8	0.00	0.00
9	0.00	0.00
10	0.00	0.00
11	0.00	0.00
12	0.00	0.00
13	0.00	0.00
14	0.00	0.00
15	0.00	0.00
16	0.00	0.00
17	0.00	0.00
18	0.00	0.00
19	0.00	0.00
20	0.00	0.00
21	0.00	0.00
22	0.00	0.00
23	0.00	0.00
24	0.00	0.00
25	0.00	0.00
26	0.00	0.00
27	0.00	0.00
28	0.00	0.00
29	0.00	0.00
30	0.00	0.00
31	0.00	0.00
32	0.00	0.00
33	0.00	0.00
34	0.00	0.00
35	0.00	0.00
36	0.00	0.00
37	0.00	0.00
38	0.00	0.00
39	0.00	0.00
40	0.00	0.00
41	0.00	0.00
42	0.00	0.00
43	0.00	0.00
44	0.00	0.00
45	0.00	0.00
46	0.00	0.00
47	0.00	0.00
48	0.00	0.00
49	0.00	0.00
50	0.00	0.00
51	0.00	0.00
52	0.00	0.00
53	0.00	0.00
54	0.00	0.00
55	0.00	0.00
56	0.00	0.00
57	0.00	0.00
58	0.00	0.00
59	0.00	0.00
60	0.00	0.00
61	0.00	0.00
62	0.00	0.00
63	0.00	0.00
64	0.00	0.00
65	0.00	0.00
66	0.00	0.00
67	0.00	0.00
68	0.00	0.00
69	0.00	0.00
70	0.00	0.00
71	0.00	0.00
72	0.00	0.00
73	0.00	0.00
74	0.00	0.00
75	0.00	0.00
76	0.00	0.00
77	0.00	0.00
78	0.00	0.00
79	0.00	0.00
80	0.00	0.00
81	0.00	0.00
82	0.00	0.00
83	0.00	0.00
84	0.00	0.00
85	0.00	0.00
86	0.00	0.00
87	0.00	0.00
88	0.00	0.00
89	0.00	0.00
90	0.00	0.00
91	0.00	0.00
92	0.00	0.00
93	0.00	0.00
94	0.00	0.00
95	0.00	0.00
96	0.00	0.00
97	0.00	0.00
98	0.00	0.00
99	0.00	0.00
100	0.00	0.00

Refer Sizing Data Sheet A-1 & A-3
(ADDITION OF BOTH A-1 & A-3 FOR RESPECTIVE CASES)

VALVE TYPE

☒ CAVITATION ☐ FLASHING

[•] HIGH DP

* MAX SHUT OFF PRESS (KG/CM2g)	336
* BODY DESIGN : PRESS (KG/CM2g) | TEMP (DEG C)	336 | 180
* IBR FORM III-C	<input checked="" type="checkbox"/> REQUIRED <input type="checkbox"/> NOT REQUIRED

.....

.....|.....

.....

TOTAL WEIGHT (VALVE + ACTUATOR + ACCESSORIES) Kg

.....

NOTES:

1. DESIGN C_v SHALL BE BASED ON SERVICE CONDITIONS INDICATED AS PER SPECIFICATION CLAUSE NUMBER 3.1.7. OF SPECIFICATION NO. : PES – 145 – 06 VOL IIB SECTION D OF TECHNICAL SPECIFICATION

	Technical specification for Control Valves with Accessories (Pneumatically Operated)		SPECIFICATION NO. PE-TS-381-145-I104	
			VOLUME II-B	
			SECTION D	
			REV. NO. 00	DATE: 26.04.2012
			SHEET 15 of 15	

Tag No..... Quantity.....

Data Sheet No. PES-145-06-DS1-1

APPLICABLE FOR TAG Nos.WHEREVER STATEMENT "REQUIRED" INDICATED IN THE INDIVIDUAL CV DATA SHEETS

DATA SHEET – A& B for ACCESSORIES

DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR) (TO BE FILLED BY PURCHASER)				DATA SHEET – B (TO BE FILLED-UP BY BIDDER)	
POSITIONER (SMART) WITH HART PROTOCOL	MFR. & MODEL NUMBER		Bidder To Specify		
	BYPASS	GAUGES	ENCL. CLASS	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<input type="checkbox"/> THREE <input checked="" type="checkbox"/> TWO <input checked="" type="checkbox"/> IP-65
	INPUT SIGNAL (Kg / Cm ²)		<input checked="" type="checkbox"/> 0.2 – 1.0 <input type="checkbox"/> 0.2 – 0.6 <input type="checkbox"/> 0.6 – 1.0		
	OUTPUT SIGNAL (Kg / Cm ²)		TO SUIT ACTUATOR		
AIR FILTER REGULATOR TWO (2) Nos. PER CV	MFR. & MODEL NUMBER		Bidder To Specify		
	AIR SUPPLY PRESS (Kg / Cm ² g)		<input checked="" type="checkbox"/> 7.0		
	OUTPUT PRESS (Kg / Cm ² g)		TO SUIT ACTUATOR		
	FILTER SIZE		5 MICRON		
AIR LOCK	MFR. & MODEL NUMBER		Bidder To Specify		
	SET PRESS (Kg / Cm ²)		Bidder To Specify		
	SUPPLY PRESS (Kg / Cm ²)		<input checked="" type="checkbox"/> 7.0		
	RESET TYPE		AUTO		
	VENT PLUG		REQUIRED		
	ENCLOSURE CLASS		<input checked="" type="checkbox"/> IP 65		
LIMIT SWITCH	MFR. & MODEL NUMBER		Bidder To Specify		
	OPEN posn	INT posn	CLOSE posn	<input checked="" type="checkbox"/> 1 NO.	<input checked="" type="checkbox"/> 1 NO.
	CONTACT TYPE		SPDT 2 NO + 2 NC		
	RATING (AC / DC)		5A 240V AC AND 0.2A 220V DC		
	ENCLOSURE CLASS		<input checked="" type="checkbox"/> IP 55 <input type="checkbox"/>		
POSITION TRANSMITTER (PART OF POSITIONER)	MFR. & MODEL NUMBER		PART OF POSITIONER		
	TYPE		<input checked="" type="checkbox"/> Electronic (2-Wire) Contactless <input type="checkbox"/> OTHER		
	SUPPLY		<input checked="" type="checkbox"/> 24V DC		
	OUTPUT RATING		<input checked="" type="checkbox"/> 4-20mA		
	ACCURACY		± 1% FS		
SOLENOID VALVE	MFR. & MODEL NUMBER		Bidder To Specify		
	RATING		<input checked="" type="checkbox"/> 24V DC <input type="checkbox"/> 220V DC <input type="checkbox"/> 240V AC <input type="checkbox"/>		
	TYPE		3-WAY (UNIVERSAL OPERATION TYPE)		
	OPERATION	QUANTITY	<input type="checkbox"/> Stayput <input checked="" type="checkbox"/> Interlock <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2		
	COIL INSULATION CLASS		CLASS - H		
HANDWHEEL	ENCLOSURE CLASS		<input checked="" type="checkbox"/> IP 65		
	ORIENTATION		<input type="checkbox"/> TOP MOUNTED <input checked="" type="checkbox"/> SIDE MOUNTED		
JUNCTION BOX	NO. OF WAYS		<input type="checkbox"/> 24-WAYS <input type="checkbox"/> AS REQUIRED <input checked="" type="checkbox"/> 36-Ways		
	SIZE		AS REQUIRED		
	CABLE GLANDS (Size / Quantity)		AS REQUIRED (Double Compression Type).		
	ENCLOSURE CLASS		<input checked="" type="checkbox"/> IP 65		
I/P CONVERTER (PART OF POSITIONER)	INPUT SIGNAL	POWER SUPPLY	PART OF POSITIONER		
	SPLIT RANGE		-----		
	ENCLOSURE CLASS		-----		
	LINEARITY		-----		
	HYSTERISIS		-----		
Cu. Tubing & Fittings / per CV	This is in addition to cu. Tubing and fittings which are integral part of CV		15 Meters of ¼ " PVC coated Cu. Tubing, with 1 set of Fittings for each CV for connection to IA Header on one end and accessories on another end of CV.		
					COMPANY SEAL
					NAME
					SIGNATURE



TITLE

EQUIPMENT SPECIFICATIONS**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION****SCCL – 2X600 MW SINGARENI TPP**

SPEC. NO.: PE-TS-381-142-N101

VOLUME **II-B**SECTION **D**REV NO. **0** DATE 25.07.2012

SHEET 1 OF 1

SECTION – D

EQUIPMENT SPECIFICATIONS

FOR

STEAM DESUPERHEATER



TITLE

EQUIPMENT SPECIFICATION**STEAM DESUPERHEATER**SPECIFICATION NO **PES-148-01**VOLUME **II-B**SECTION **D**REV NO. **0** DATE 05.02.2008SHEET **1 OF 3****1.0.0 GENERAL**

This standard specification covers the design, materials, construction features, manufacturing process, assembly, inspection and testing requirements, painting and packing requirements of Steam Desuperheater along with spray nozzle.

2.0.0 CODES AND STANDARDS

2.1.0 The design, manufacture, inspection and testing of the equipment shall comply with the requirements of the latest national and international codes and standards wherever applicable. Wherever the specific code requirements are specified herein, the same shall be adhered to.

In particular, the equipment shall be designed to comply with latest editions of the following standards

- (i) Indian Boiler Regulations (IBR).
- (ii) ASME Section - VIII / Div. - 1.
- (iii) Material specifications as per ASTM, AISI.


3.0.0 DESIGN AND CONSTRUCTIONAL FEATURES

3.1.0 The desuperheater shall be of direct mixing mechanical spray type. The assembly shall consist of desuperheater pipe with steam inlet and outlet & spray water connection along with spray nozzle. The spray nozzle shall direct the spray in the direction of steam flow for proper mixing and arranged in such position that direct impingement of spray water on desuperheater walls is avoided.

3.2.0 The spray nozzle shall be accurately sized for best results in total range as stipulated in the data sheet.


3.3.0 The desuperheater shall be complete with matching counter flanges including bolts, nuts, gaskets, necessary reducers / expanders to suit purchaser's pipe line and supporting legs / pads & holding down bolts as required.

3.4.0 The material of construction shall be as indicated in Data Sheet – A.

	TITLE EQUIPMENT SPECIFICATION STEAM DESUPERHEATER	SPECIFICATION NO PES-148-01	
		VOLUME II-B	
		SECTION D	
		REV NO. 0	DATE 05.02.2008
		SHEET 2 OF 3	

4.0.0 SHOP INSPECTION AND TEST

- 4.1.0 The bidder shall submit along with the offer the Quality Plans in the enclosed format together with all reference documents/standards etc. as applicable.
- 4.2.0 Indicative Quality Plans, specifying minimum checks and tests as considered necessary are enclosed along with this specification for compliance. These however are not intended to exhibit the total comprehensive testing programmes, which are the responsibility of the bidder.
- 4.3.0 Detailed Quality Plans to be submitted by the bidders should also include all the checks/tests carried out by the suppliers as part of their normal practice. The Quality Plans submitted by the bidders shall be subject to approval of BHEL/their Customer who reserves the right to ask for further checks during finalization of Quality Plans. BHEL/their Customer shall indicate customer hold points in the approved Quality Plans beyond which the work shall not proceed without their approval.
- 4.4.0 The supplier shall furnish their production program along with scheduled dates of testing at least three months in advance to enable BHEL/their customer to plan for witnessing the tests identified as hold points.
- 4.5.0 Material identification and co-relation with test certificates for all major components shall be essentially required. In absence of these, the material of each component shall be tested as per relevant specification for Chemical Composition and Mechanical properties i.e. Yield Stress, Ultimate Tensile Stress, Impact test, % Elongation, % Reduction in Area, Hardness etc. In addition, to ensure freedom from surface and sub-surface defects, suitable Non Destructive Testing shall also be carried out.
- 4.6.0 Following tests shall be done at Manufacturers' works during various stages as minimum requirement :
- 4.6.1 Visual examination of all components.
- 4.6.2 Check for weld joints for proper fit up, Dye Penetration Test after root run and final welding. 100% Radiographic test as per ASTM E 165 for all butt welds.
- 4.6.3 Verification of stress relieving chart if post-weld heat treatment is called for.
- 4.6.4 Check / test for pressure retaining bolts and nuts as per relevant Codes/Standards.
- 4.6.5 Dimension check for all components including surface finish.

	TITLE	SPECIFICATION NO PES-148-01	
	EQUIPMENT SPECIFICATION	VOLUME II-B	
	STEAM DESUPERHEATER	SECTION D	
		REV NO. 0	DATE 05.02.2008
		SHEET 3 OF 3	
<p>4.6.6 Hydraulic Test to two times the rated design pressure for desuperheater body and other pressure retaining parts.</p> <p>4.6.7 Check for final completeness, cleaning, surface finish, appearance, identification, surface preparation, painting, marking and packing including spares.</p> <p>4.6.8 The equipment comes under the purview of IBR (Indian Boiler Regulations). All tests certificates duly signed by Chief Inspector (IBR) / authorized representative shall be furnished in IBR from III-C.</p> <p>4.6.9 The particulars of proposed shop tests and process of test shall be submitted to BHEL/their Customer along with Quality Plan for approval.</p> <p>5.0.0 <u>PERFORMANCE REQUIREMENTS</u></p> <p>Bidder shall guarantee that equipment offered shall meet the rating and performance requirements as stipulated in this specification. In case it is not as per guarantee furnished by the bidder, the deficiency shall be made good by the bidder by rectification / replacement of defective parts within reasonable time at their own cost inclusive of cost of transportation both ways if required. The Purchaser is entitled to reject the equipment in case of repeated failures to meet the guaranteed performance.</p> <p>6.0.0 <u>PAINTING</u></p> <p>6.1.0 All foundry sand and loose material shall be removed and surface should be made thoroughly clean for further protection as required.</p> <p>6.2.0 A shop coat of paint, removable after installation at site, shall be applied to all steel surfaces and other exposed surfaces requiring corrosion protection during transit and storage at site.</p> <p>7.0..0 <u>PRESERVATION, MARKING AND PACKING</u></p> <p>7.1.0 A Stainless Steel metal nameplate should be permanently fixed on each equipment giving its Tag. No. and technical specifications i.e. Service, Size, Pressure Rating etc.</p> <p>7.2.0 All equipments / materials shall be packed suitably and protected from impact, abrasion, corrosion, incidental damage due to vermin, Sun-light, high temperature, rain, moisture, humidity, dust, sea water (where applicable) as well as rough handling during entire period of dispatch, storage and erection including delays in transit and storage in open.</p> <p>7.3.0 Spares shall be packed separately and marked clearly for identification. These shall be specially packed for long storage without damage.</p>			



TITLE

EQUIPMENT SPECIFICATION

STEAM DESUPERHEATER

For

2x600 MW SCCL - SINGARENI

SPEC. NO.: PE-TS-381-142-N101

VOLUME **II-B**

SECTION **D**


REV NO. **0** DATE 25.07.2012

SHEET 1 OF 1

DESUPERHEATER DATA SHEET A-1

DATA SHEET FOR LOW TEMP. DESUPERHEATER DESH-2

S.NO	DESCRIPTION	UNITS	DATA FOR HIGH CAP. PRDS DESUPERHEATER
1.0	TAG NO.		DESH-2
2.0	TYPE	VARIABLE ORIFICE / VENTURI TYPE	
3.0	STEAM PARAMETERS	(INLET OF DESUPERHEATER)	
3.1	FLOW	T/HR	REFER SIZING DATA SHEET A-3
3.2	PRESSURE	Kg/cm ² (a)	BIDDER TO DECIDE BASED ON SIZING DATA
3.3	TEMPERATURE	°C	BIDDER TO DECIDE BASED ON SIZING DATA
4.0	STEAM PARAMETERS (OUTLET OF DESUPERHEATER)	REFER SIZING DATA SHEET A-3	
5.0	SPRAY WATER PARAMETERS		(INLET OF DESUPERHEATER)
5.1	FLOW	T/HR	REFER SIZING DATA SHEET A-3
5.2	PRESSURE	Kg/cm ² (a)	BIDDER TO DECIDE BASED ON SIZING DATA
5.3	TEMPERATURE	°C	REFER SIZING DATA SHEET A-3
6.0	END DETAILS	(STEAM INLET / OUTLET)	
6.1	TYPE / MATCHING PIPE	mm x mm	BW / 273 x 6.35
7.0	END DETAILS	(SPRAY WATER INLET)	
7.1	TYPE / MATCHING PIPE		SW/ 48.3 x 10.15
8.0	MATERIALS OF CONSTRUCTION		
8.1	BODY		A217 WCB
8.2	PIPE		SA 106GRB
8.3	SPRAY NOZZLE WITH ASSEMBLY		SS 316 (Spray Nozzle design pressure shall be equal to Design Spray Water Pressure)
9.0	DESIGN PARAMETERS		
9.1	DESIGN PRESSURE	Kg/cm ² (g)	20
9.2	DESIGN TEMPERATURE	°C	360

	TITLE EQUIPMENT SPECIFICATIONS AUXILIARY STEAM PRESSURE REDUCING & DESUPERHEATING STATION SCCL – 2X600 MW SINGARENI TPP	SPEC. NO.: PE-TS-381-142-N101	
		VOLUME	II-B
		SECTION	D
		REV NO.	0 DATE 25.07.2012
		SHEET	1 OF 1

DATA SHEET-C

LIST OF DOCUMENTS AND DATA TO BE SUBMITTED AFTER AWARD OF CONTRACT

The list of documents and data to be submitted by the successful bidder after the award of the contract are specified in Data Sheet - C.

The supplier shall after award of contract submit FIFTEEN (15) sets of the following documents for purchaser's approval / vetting.

- (i) Certified final drawings & data sheets as per cl. 4.0.0 of section-C.
- (ii) Quality Plans, Inspection/Test Reports as agreed with the Purchaser.
- (iii) Material and Hydraulic Test Certificates along with IBR form III C.
- (iv) Performance Test Procedures and Reports.
- (v) Field Quality Plan as agreed.
- (vi) Storage Instructions.
- (vii) List of Commissioning, Mandatory and Recommended Spares.
- (viii) List of Tools and Tackles required.
- (ix) List of lubricants.
- (x) Operation and Maintenance Instruction Manual.

NOTE: Above list is only tentative. Successful bidder shall prepare detailed schedule of Drawings/ Documents, which shall be mutually agreed and included in the contract document/ordering Specification.



TITLE

EQUIPMENT SPECIFICATIONS

**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION**

SCCL – 2X600 MW SINGARENI TPP

SPEC. NO.: PE-TS-381-142-N101

VOLUME **II-B**

SECTION **D**

REV NO. **0** DATE 25.07.2012

SHEET 1 OF 1

FINAL DOCUMENTATION

S.NO.	DESCRIPTION	INITIAL SUBMISSION FOR APPROVAL TO BHEL	COPIES FOR NLC/TCE APPROVAL AFTER BHEL CLEARANCE
1.	Vendor drawing / document for approval Note : <ul style="list-style-type: none"> Initial submissions with Rev. No. P0, P1, P2 etc. After BHEL clearance, submission to MAHAGENCO with Rev. No. R0, R1, R2 etc. 	05+Soft Copy	18+Soft Copy
2.	Issue of action A/B/C Civil / Erection Drawings / documents for construction at site (for civil packages only)	8	
3.	Release of finally approved drawings / documents (action A/E) i.e. distribution prints	22 + Soft Copy	
4.	O&M Manuals	2	24
5.	“As-Built” drawings	12	



TITLE

EQUIPMENT SPECIFICATIONS

**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION**

SCCL – 2X600 MW SINGARENI TPP

SPEC. NO.: PE-TS-381-142-N101


VOLUME **II-B**

SECTION **D**

REV NO. **0** DATE 25.07.2012


SHEET 1 OF 1

QUALITY PLAN


MANUFACTURERS NAME & ADDRESS (AS PER NTPC APPROVED VENDOR LIST)		STANDARD MANUFACTURING QUALITY PLAN							PROJECT: 2 X 600 MW SCCL TPP CONTRACT No.: 381 CONTRACTOR: BHEL-PEM					
<div></div>		COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	Agency				Remarks
										D	M	C	N	
1	2	3	4	5	6	7	8	9	10	11				
1.1	Body & Bonnet castings/Forgings, Plug stem, Actuator stem, Seat Ring	Physical, Chemical Props Heat Treatment Internal Quality of castings	MA	Phys.Chem Tests Review of HT RT for body & UT for Bonnet (NDT)	1/Heat (HT Batch) Each HT 100%	Tech.Spec / Apprd Drg DO ANSI B16.34	Tech.Spec / Apprd Drg DO ANSI B16.34	TC TC Test Report	✓ ✓ ✓	P, W P, W P, W	V V V	V V V	Only for Rating 900 & Above. Applicable for body & Bt. only. For lower rating as called for in spec. (NTPC). Valve stem for dia > 40mm shall be done UT on 100% as per ASTM A-388 A & ASME B 16.34, CHP for review of records.	
		Surface Quality	MA	Visual	100%	MSS SP 55	MSS SP 55	TC	✓	P, W	V	-		
		Pressure test for shell	MA	Hyd. Test	100%	ANSI B16.34	ANSI B16.34	TC	✓	P, W	V	-		
														For Body & Bonnet after machining

		LEGEND:		FOR NTPC USE		DOCUMENT No.	
		*RECORDS IDENTIFIED WITH "TICK" SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION					
PREPARED BY		APPROVED BY					
						1 OF 9	
		SIGNATURE		REVIEWED BY			
						NAME & SIGN. OF APPROVING AUTHORITY & SEAL	


CR = Critical, MA = Major, MI = Minimum, TC = Test Certificate, P = Perform, W = Witness, V = Verification,

		MANUFACTURERS NAME & ADDRESS (AS PER NTPC APPROVED VENDOR LIST)			STANDARD MANUFACTURING QUALITY PLAN				PROJECT: 2 X 600 MW SCCL TPP CONTRACT No.: 381 CONTRACTOR: BHEL-PEM																		
		COMPONENT & OPERATION		CHARACTERISTICS		CLASS		ITEM : CONTROL VALVES REV. : 00 DATE : 30.10.09		ACCEPTANCE NORMS		REFERENCE DOCUMENT		QUANTUM OF CHECK		TYPE OF CHECK		SUB SYSTEM :		FORMAT OF RECORDS		Agency D M C N				Remarks	
1		2		3		4		5		6		7		8		9		10				11					
1.2		Diaphragm		Surface Quality		MA		Visual		100%		Mfr. Std		Mfr. Std.		TC				P, W		V		-			
				Hardness		MA		Measurement		100%		DO		DO		TC				P, W		V		-			
				Endurance/Life		MA		Cyclic 10,000 Cycles		1/Type		10,000 Cycles, as per Mfr. Std		No Damage		TC				P, W		V		-			

LEGEND: *RECORDS, IDENTIFIED WITH "TICK" SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION ** M: MANUFACTURER/SUBCONTRACTOR C: CONTRACTOR/NOMINATED INSPN. AGENCY N: NTPC INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION AS APPROPRIATE "CHP" NTPC SHALL IDENTIFIED IN COLUMN "N"		FOR NTPC USE		DOCUMENT No.	
		REVIEWED BY		2 OF 9	
PREPARED BY		APPROVED BY			
SIGNATURE				NAME & SIGN. OF APPROVING AUTHORITY & SEAL	
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				W = Witness,	
				V = Verification,	


<div></div> <div>MANUFACTURERS NAME & ADDRESS</div> <div>(AS PER NTPC APPROVED VENDOR LIST)</div>		STANDARD MANUFACTURING QUALITY PLAN										PROJECT: 2 X 600 MW SCCL TPP					
		ITEM : CONTROL VALVES					REV. : 00 DATE : 30.10.09					CONTRACT No.: 381 CONTRACTOR: BHEL-PEM					
		SUB SYSTEM :															
Sl. No.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	Agency			Remarks					
1	2	3	4	5	6	7	8	9	D	M	C	N	11				
1.3	Springs	Composition	MA	Chemical Analysis	1 Sample Heat/lot	Matl.spec/ Mfr. Std	Matl.spec/ Mfr. Std	TC	P, W	V	-						
		Mech. Props.	MA	Mech Test	DO	DO	DO	TC	P, W	V	-						
		Dimension	MA	Measurement	DO	Mfr. Std	Mfr. Std	IR	P, W	V	-						
		Performance	MA	Stiffness Ratio	100%	Apprd Drg/Matl spec	ApprdDrg/ Matl. spec.	TC	P, W	V	-						
				Cyclic Test (Endurance)	1/Type	DO	DO	TC	P, W	V	-						

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		TC = Test Certificate,		W = Witness,	
				3 OF 9	

MANUFACTURERS NAME & ADDRESS (AS PER NTPC APPROVED VENDOR LIST)		STANDARD MANUFACTURING QUALITY PLAN							PROJECT:2 X 600 MW SCCL TPP CONTRACT No.: 381 CONTRACTOR: BHEL-PEM					
		COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	Agency				Remarks
										D	M	C	N	
Sl. No.	1	2	3	4	5	6	7	8		9	10				11
2.0	IN PROCESS													
2.1	Body & Bonnet after machining & plug, Plug with Actuator Stem,	Surface Flaws * MP FOR BODY & BONNET ONLY	MA	* MP/ PT (*SEE NOTE 6)	All Accessible surface	ANSI B16.34	ANSI B16.34	Mfr's std	Test Records(N DT)	P	V	-	Butt weld shall be included	
		Dimensional check	MA	Measurement	100%	Mfr's std	Mfr's std	Mfr's std	Log sheets	P	-	-		
		Hardfacing wherever Applicable	MA	Hardness Meas.	Sample Pads	Mfr's std	Mfr's std	Mfr's std	Records	P	V	-		
	Guide Bush(Wherever applicable)	Dimensionsl	MI	Measurement	100%	Appd drg	Appd drg	Appd Drg	Log sheet	P	-	-		
	Lapping	Machining surface contact	MA	Blue Matching	100%	-----	-----	Proper Physical Contact	-----	P	-	-		

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PREPARED BY	APPROVED BY	REVIEWED BY		5 OF 9	
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MANUFACTURERS NAME & ADDRESS (AS PER NTPC APPROVED VENDOR LIST)			STANDARD MANUFACTURING QUALITY PLAN						PROJECT: 2 X 600 MW SCCL TPP CONTRACT No.: 381 CONTRACTOR: BHEL-PEM					
	COMPONENT & OPERATION		CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	Agency				Remarks
	Sl. No.									D	M	C	N	
1	2	3	4	5	6	7	8	9	10	11				
3.0	TESTS ON COMPLETED VALVES													
3.1	Actuator Chamber	Strength and Leakage	MA	Pneu test	100%	-----	No leakage	TC	✓	P	W	W		
3.2	Body	Leak and Pr. Test	MA	Hydro test	100%	ANSI B16.34	ANSI B16.34	TC	✓	P	W	W		
3.3	Seat leakage test for completed valve	Seat leakage	MA	Hydro test/pneumatic Test(As applicable)	100%	ANSI B16.104	Appd Data sheet/ANSI B16.104	TC	✓	P	W	W		
3.4	Operation tests on completed valve	Valve Travel opening and closing time Linearity/CAM characteristics Hysterisis	MA	Measurement	100%	As per spec & appd drgs As per spec and Appd drgs As per spec and Appd drgs As per spec and Appd drgs	As per spec & appd drgs As per spec and Appd drgs As per spec and Appd drgs As per spec and Appd drgs	TC TC TC TC	✓ ✓ ✓ ✓	P P P P	W W W W	W W W W		


MANUFACTURERS NAME & ADDRESS (AS PER NTPC APPROVED VENDOR LIST)		STANDARD MANUFACTURING QUALITY PLAN		PROJECT: 2 X 600 MW SCCL TPP CONTRACT No.: 381 CONTRACTOR: BHEL-PEM	
Sl. No.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	ITEM : CONTROL VALVES SUB SYSTEM :	
				TYPE OF CHECK	QUANTUM OF CHECK
1	2	3	4	5	6
3.0	TESTS ON COMPLETED VALVES				
3.1	Actuator Chamber	Strength and Leakage	MA	Pneu test	100%
3.2	Body	Leak and Pr. Test	MA	Hydro test	100%
3.3	Seat leakage test for completed valve	Seat leakage	MA	Hydro test/pneumatic Test(As applicable)	100%
3.4	Operation tests on completed valve	Valve Travel opening and closing time Linearity/CAM characteristics Hysteresis	MA	Measurement	100%
			MA	Measurement	100%
			MA	Measurement	100%
			MA	Measurement	100%

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MANUFACTURERS NAME & ADRESS (AS PER NTPC APPROVED VENDOR LIST)				STANDARD MANUFACTURING QUALITY PLAN						PROJECT: 2 X 600 MW SCCL TPP CONTRACT No.: 381 CONTRACTOR: BHEL-PEM																																													
Sl. No.				ITEM : CONTROL VALVES SUB SYSTEM :				REV. : 00 DATE : 30.10.09		Agency				Remarks																																									
								TYPE OF CHECK		QUANTUM OF CHECK		REFERENCE DOCUMENT		ACCEPTANCE NORMS		FORMAT OF RECORDS		D M C N																																					
1				2				3				4				5				6				7				8				9				10				11															
3.5				CV test				Valve characteristics PR. Vs Discharge and Discharge Vs opening 0 to 100% in steps of 10%.				MA				Measurement				1/type				As per spec and Appd drgs				As per spec and Appd drgs				TC				✓				P				V				* NTPC engg. Clearance for CV test shall be reviewed during final inspection.							
3.6				Accessories				Operating of limit switch & solenoids and other accessories Predefined valve posn incase of Air failure				MA				Measurement Visual				100% 100%				As per spec and Appd drgs As per spec and Appd drgs				As per spec and Appd drgs As per spec and Appd drgs				TC TC				✓ ✓				P P				W W				W W				CHP 'D' Accessories as per approved hook-up diagram			
3.7				Final Inspn.				Overall Dimn. Cleanliness,Painting,stampi ng etc.				MI				Visual & Dimension Visual				100% 100%				Appd drgs As per spec and Appd drgs				Appd drgs As per spec & Appd drg.				Records Records				✓ P				W V				W -											
* in case CV tests have been carried out in the past and document generated, the same shall be furnished to the employer for approval																																																							


FOR NTPC USE		DOCUMENT No.	
REVIEWED BY		7 OF 9	
NAME & SIGN. OF APPROVING AUTHORITY & SEAL			

CR = Critical, MA = Major, MI = Minimum, TC = Test Certificate, P = Perform, W = Witness, V = Verification,

MANUFACTURERS NAME & ADDRESS		STANDARD MANUFACTURING QUALITY PLAN					PROJECT: 2 X 600 MW SCCL TPP							
<div></div> <div>(AS PER NTPC APPROVED VENDOR LIST)</div>		COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	Agency				Remarks
										D	M	C	N	
1	2	3	4	5	6	7	8	9	10	11				
3.8	AUXILIARY ITEMS													
1.	Positioner	Accuracy Top & Bottom Nozzle Nozzle leakage Overall leakage after assy.	MA MA MA	Measurement Leak test -do-	1/type -do- -do-	Mfg std -do- -do-	Mfg. std -do- No leakage	TC TC TC	P P P	V V V	- - -			
2	Air Filer Regulator	Normal Air consumption Overall leakage	MA MA	Measurement Visual (Soap Solution)	1/type 100%	Mfg. std Mfg. std	No leakage No leakage	TC TC	P P	V V	- -			
3	Air Lock Relay	Performance test	MA	Leakage test	100%	Mfg. std	Mfg. std	TC	P	V	-			


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		REVIEWED BY		8 OF 9	
SIGNATURE		NAME & SIGN. OF APPROVING AUTHORITY & SEAL			


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		MANUFACTURERS NAME & ADDRESS (AS PER NTPC APPROVED VENDOR LIST)		STANDARD MANUFACTURING QUALITY PLAN				PROJECT: 2 X 600 MW SCCL TPP CONTRACT No.: 381 CONTRACTOR: BHEL-PEM				
Sl. No.	COMPONENT & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	Agency D M C N			Remarks
1	2	3	4	5	6	7	8	9	10			11
4	Electric Position transmitter	Performance/Movement of slide wire Wiring connection. Cyclic test Accuracy	MA	Operation	100%	Mfg. std	Mfg. std	TC	P	W, - V		
			MA	Continuity	100%	Mfg. std	Mfg. std	TC	P	V	-	
			MA	10000 operation cycles	1/type	Mfg. std	Mfg. std	TC	P	V	-	
			MA	Operation	100%	Appd. Data sheets	Appd. Data sheets	TC	P	W, - V		

Note: 1. IBR certificates in Form III C shall be submitted if called for in the specification "D"
2. Copies of all TC for materials duly correlated with Heat numbers, TC for electrical items and mechanical tests (Leak/Operation) shall be furnished to BHEL for verification and acceptance.
3. Material test certificates shall be offered for verification during final inspection.
4. 'D' – Documents to be provided as part of documentation pkg.
5. Sub-contractor for valve casting & accessories as per BHEL approval. No NTPC approval required.
6. * NDT Shall be as per ANSI B16.34.

LEGEND:		FOR NTPC USE	DOCUMENT No.
PREPARED BY	APPROVED BY	REVIEWED BY	9 OF 9
SIGNATURE			NAME & SIGN. OF APPROVING AUTHORITY & SEAL
CR = Critical,	MA = Major,	P = Perform,	W = Witness, V = Verification,

	MANUFACTURER'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN							PROJECT : 2X 600 MW SINGARENI				
			ITEM : DESUPER HEATER SUB SYSTEM : For Aux. PRDS without control valve				QP No : 1611 / 09		PACKAGE : STG PACKAGE					
							REV No : 00		CONTRACT No:					
							DATE : 25.07.2012		MAIN SUPPLIER : BHEL-PEM					
							PAGE 01 OF 02							
SL NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK M C/N		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	\$	M	C	N	REMARKS
I. INCOMING MATERIAL CONTROL:-														
1.1	*Body	Composition	Maj	chemical	1/Heat (HT Batch)	1/Heat	As per matl specn & appd data sheet	As per matl specn & appd data sheet	MTC	✓	P	V	V	
		Strength	Maj	Mechanical	1/Heat (HT Batch)	1/Heat	DO	DO	MTC	✓	P	V	V	
		Heat Treatment	Maj	Review of HT	100%	100%	As per matl specn & appd data sheet		MTC	✓	P	V	V	
		NDT (Forgings for Dia > 40)	Maj	UT or RT	100%	100%	ASME B16.34	DIN EN(ISO)	MTC	✓	P	V	V	
1.2	**Nozzle & inernals	Material selection	Maj	Suitability	100%	100%	As per matl specn & appd data sheet		CC	✓	P	V	V	
		NDT For forgings	Maj	UT	100%	100%	ASME B16.34	DIN EN(ISO)	CC	✓	P	V	V	
2. BOUGHT OUT ITEMS														
2.1	Pr. Retaining fastners (ASTM A193 Gr B7 & ASTM A 194 Gr 2H)	Composition	Maj	Chemical	One/batch	One/batch	data sheet Appd.byBHEL	ASTM specn	MTC	✓	P	V	V	If applicable
		Strength	Maj	Physical test	One/batch	One/batch	DO	DO	MTC	✓	P	V	V	
		Dimension	Maj	Mechanical	Sampling as per IS 2500 Pt. I	Sampling as per IS 2500 Pt. I	part drawing	part drawing	IR	✓	P	V	V	
3. IN PROCESS INSPECTION CONTROL														
3.1	Welding	WPS/PQR/WPQ	Maj	Review	100%	100%	ASME IX	DIN EN(ISO)	QCR		P	V	V	
3.2	Body, Trims after machining	Dimension & Surface finish NDT	Maj	Measurement	100%	100%	ASME B16.34	ASME B 16.34	QCR		P	V	V	
			Maj	LPI on machined area & Butt Weld Ends	100%	100%	ASME B16.34	ASME B16.34	QCR		P	V	V	
			Maj	MPI on connecting piece fillet weld	100%	100%	ASME B16.34	ASME B16.34	QCR		P	V	V	
MANUFACTURER / SUB CONTRACTOR		CONTRACTOR	LEGEND: RECORDS IDENTIFIED WITH THE TICK SHALL BE INCLUDED BY SUPPLIER IN QA DOCUMENTATION. **M:MANUFACTURER / SUB CONTRACTOR C:MAIN SUPPLIER N: NTPC INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION AS APPROPRIATE "CHP" NTPC SHALL IDENTIFIED IN COLUMN "N" AS "W". "MTC" MILL/MANUF TEST CERTIFICATE;QCR- QUALITY CONTROL CERTIFICATE REPORTS							<div>  </div> DOC No :				
SIGNATURE										FOR NTPC USE	REVIEWED BY		APPROVED BY	APPROVAL SEAL

		MANUFACTURER'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN						PROJECT : 2X 600 MW SINGARENI				
				ITEM : DESUPER HEATER		QP No : 1611 / 09			PACKAGE : STG PACKAGE					
						REV No : 00			CONTRACT No:					
						DATE : 25.08.2012			MAIN SUPPLIER : BHEL-PEM					
				SUB SYSTEM : For Aux. PRDS without control valve		PAGE 02 OF 02								
SL NO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N				\$	M	C	N	
4. FINAL INSPECTION														
4.1	Assembly	Completeness	Maj	Visual	100%	100%	Appd drawing / purchase specification	QCR	✓	P	W	W		
		Dimension	Maj	Measurement	100%	100%			QCR	✓	P	W		W
		Pressure test	Maj	Hydro test	100%	100%	ASME B16.34	Appd Data sheet	QCR	✓	P	W		W
		Compilation of test cert. & records	Maj	Verification	100%	100%	As per appd data sheet / appd drawing		QCR	✓	P	V		V
5 NAME PLATE DETAILS & IBR CERTIFICATION														
5.1	Name plate details	Visual	Maj	Verification	100%	100%	Purchase Specification	QCR	✓	P	V	V		
5.2	IBR certification	Verification	Maj	Verification	100%	100%	IBR Form IIIC	IBR Cert.	✓	P	V	V		
6 PAINTING & PRESERVATION														
6.1	Surface painting	Finish	Maj	Verification	100%	100%	NTPC appd painting scheme	CC		P	V	--	CHP	
6.2	Packing	Marking, Packing slip	Maj	Verification	100%	100%	Manufacturers std /Purchase specification	Packing slip		P	V	--		
6.3	Insp Clearance	Doc compilation of TC & records	Maj	Verification	100%	100%	Doc as per appd QAP & IBR Form IIIC		--	P	V	V		
MANUFACTURER / SUB CONTRACTOR		CONTRACTOR	LEGEND: RECORDS IDENTIFIED WITH THE TICK SHALL BE INCLUDED BY SUPPLIER IN QA DOCUMENTATION. **M:MANUFACTURER / SUB CONTRACTOR C:MAIN SUPPLIER N: NTPC INDICATE "P" PERFORM "W" WITNESS AND "V" VERIFICATION AS APPROPRIATE "CHP" NTPC SHALL IDENTIFIED IN COLUMN "N" AS "W". "MTC" MILL/MANUF TEST CERTIFICATE;QCR- QUALITY CONTROL CERTIFICATE REPORTS								DOC No :			
SIGNATURE									FOR NTPC USE	REVIEWED BY	APPROVED BY	APPROVAL SEAL		



TITLE

EQUIPMENT SPECIFICATIONS

**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION**

SCCL – 2X600 MW SINGARENI TPP

SPEC. NO.: PE-TS-381-142-N101

VOLUME **II-B**

SECTION **D**

REV NO. **0** DATE 25.07.2012

SHEET 1 OF 1

TENDER DRAWINGS

COPY RIGHT AND CONFIDENTIAL



BS

1. EQUIPMENTS IN BIDDER'S SCOPE HAVE BEEN MARKED AS

[illegible]

THE SINGARENI COLLIRIES
COMPANY LIMITED

2X600 MW SCCL COAL BASE TPP

TECHNICAL SPECIFICATION
FOR
**AUXILIARY STEAM PRESSURE REDUCING
AND DESUPERHEATING STATION
ALONGWITH ACCESSORIES**

VOLUME - III

SPECIFICATION No: PE-TS -381-142-N101 (REV 00)



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
PPEI, NOIDA, INDIA**




TITLE

PREAMBLESPECIFICATION NO **PE-SS-999-100-Q-001**VOLUME **III**SECTION **PREAMBLE**REV NO. **0** | DATESHEET **1 OF 1****VOLUME – III TECHNICAL SCHEDULES**

1.0 This volume contains technical schedules and Data Sheets – B , which are to be duly filled by the bidder and the same shall be furnished with the technical bid as per instructions given in Document No. PES-100-901 in Volume-III.

2.0 The requirements mentioned in Section – C / Data Sheets – A of Section – D shall prevail and govern in case of conflict between the same and the corresponding requirements mentioned in the descriptive portion in Section – D.

	TITLE AUXILIARY STEAM PRESSURE REDUCING & DESUPERHEATING STATION	SPEC. NO.: PE-TS-381-142-N101	
		VOLUME III	
		SECTION	CONTENTS
		REV NO. 0	DATE 25.07.2012
		SHEET 1 OF 3	

1.0

Volume III comprises of following: -

1.1

Data Sheet : Data Sheet(s) ‘B’ Section ‘D’.

1.2

Schedules :
PART – A : Technical Schedules
PART – B : Price Schedules
(See clause 2 (b) below for unpriced schedules)

The Schedule and Data Sheets enclosed/indexed shall be completely filled up by the bidder and furnished with the bid duly signed and stamped by the bidder. Purchaser reserves the right to ask the bidder to fill additional schedules, which are not listed in the contents.

2.0

Form No. PEM-6020 is a ‘Checklist’, which is enclosed to facilitate the bidder to make sure that the necessary data/information is furnished by him in his bid. The remarks column of this schedule shall be filled up by the bidder as per the instructions given below:-

a)

The bidder shall write ‘Not Applicable’ against those schedules / documents which are not listed in the contents.

b)

The bidder shall write ‘Enclosed’ for the listed schedules / documents which are filled and furnished by the bidder with the bid. Otherwise ‘Not Enclosed’ shall be written.

c)

Duly filled Part-A schedules as well as Data Sheet-B shall be furnished with the technical offer while Part-B (Price Schedules) shall be submitted with price offer in separate covers.

d)

Wherever unpriced schedules are to be furnished with Part-A schedules in tech. bids. the same is indicated in the filling space of price schedule formats.

e)

Other documents / information as required in the checklist shall also be furnished by the bidder.

3.0

The Data Sheet(s)-B shall be filled-up completely and typed written and shall be duly signed with Rev. No. and date. One copy of the same shall be furnished with the bid. The items, which deviate from the specification, shall be marked with an asterisk (*) in the data sheets and details shall also be given in the ‘Schedule of deviations’ from technical specification (Form No. PEM-6036).

4.0

Bidder shall fill specification No. in all schedules .

5.0

Schedules PEM – 6020 & PEM 6040 duly filled in shall be enclosed by bidder both in Technical and price offers.



TITLE

**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION**

SPEC. NO.: PE-TS-381-142-N101

VOLUME **III**

SECTION **CONTENTS**

REV NO. **0** DATE 25.07.2012

SHEET 2 OF 3

CONTENTS

PART-A

<u>SL.NO.</u>	<u>FORM NO.</u>	<u>FORM DESCRIPTION</u>	<u>NO. OF SHEETS</u>
1.		Data Sheet-C for Control Valves	3
2.		Data Sheet-C for Steam Desuperheater	2
3.	PE-6020	Check List - List of Schedules	1
4.	PE-6024	Schedule of Drawings / Catalogues submitted with bid	1
5.	PE-6026*	Schedule of Equipment, Manufacture, Dispatch & Shipment to Site	1
6.	PE-6027*	Schedule of Weights & Dimensions	1
7.	PE-6030*	Inspection Schedule	1
8.	PE-6036	Schedule of Deviations	1
9.	PE-6040	Schedule of Declaration	1
10.	PE-6041*	Quality Plan	1
11.	PE-6042-00	Instructions for filling up the Quality Plan	1
12.	PE-6042*	Vendor's Drawings / Document Schedule	1
13.	PE-6046*	Inspection Request	1

* To be filled up by successful bidder after LOI.



TITLE

**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION**

SPEC. NO.: PE-TS-381-142-N101

VOLUME **III**SECTION **CONTENTS**REV NO. **0** DATE 25.07.2012

SHEET 3 OF 3

CONTENTS**PART-B**

<u>SL.NO.</u>	<u>FORM NO.</u>	<u>FORM DESCRIPTION</u>	<u>NO. OF SHEETS</u>
1.	PE-6051	Schedule of Prices	1
2.	PE-6052	Schedule of Unit Prices	1
3.	PE-6053	Schedules of Prices for Commissioning & Mandatory Spares	1
4.	PE-6054	Schedule of Prices for Recommended Spares	1
5.	PE-6055	Schedule of Prices for Erection & Maintenance Tools & Tackles	1
6.	PE-6056*	Schedule of Bidder's Man-power for Supervision of E & C and their Charges	1

* to be filled up by successful bidder after LOI.



TITLE

**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION**

SPEC. NO.: PE-TS-350-142-N101

VOLUME **III**

SECTION **PART-A**

REV NO. **0** DATE 25.09.2010

SHEET **1** OF **1**

**VOLUME-III
PART-A**

SCHEDULES AND DATA SHEETS



TITLE

EQUIPMENT SPECIFICATIONS

**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION**

SPEC. NO.: PE-TS-381-142-N101

VOLUME **III**


SECTION **D**

REV NO. **0** DATE 25.07.2012

SHEET 1 OF 1

DATA SHEETS - C
**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION**

(TO BE FILLED BY SUCCESSFUL VENDOR AFTER THE AWARD OF CONTRACT)


	Technical specification for APRDS CONTROL VALVES (Pneumatically Operated) 2x600 MW SINGARENI TPP	SPECIFICATION NO. PE-TS-381-142-N101	
		VOLUME III	
		SECTION D	
		REV. NO. 00	DATE: 25.07.2012
		SHEET 1 of 3	


		NAME
		SIGNATURE
		DATE
Tag No..... Quantity.....		Data Sheet No. PES-145-06-DS2-0
DATA SHEET C		
DATA SHEET – C FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR) (TO BE FILLED BY THE BIDDER AFTER THE AWARD OF CONTRACT)		
GENERAL*	PROJECT	
	SERVICE	
	LOCATION	
	DUTY	
	PIPE SIZE (inlet / outlet)	
	PIPE MATERIAL (inlet / outlet)	
BODY	MODEL NUMBER	
	TYPE OF BODY : GUIDING : NO. OF PORTS	
	BODY SIZE : PORT SIZE : DESIGN DV	
	END CONNECTION & RATING (ANSI)	
	BODY MATERIAL	
	PACKING MATERIAL SINGLE / DOUBLE	
	BONNET TYPE	
	TRIM FORM	
	TRIM MATERIAL : SEAT | PLUG	
	TRIM MATERIAL : CAGE | GUIDE	
	FLOW	
	OUTLET VELOCITY	
	REQUIRED LEAKAGE CLASS	
	NOISE LEVEL (dBA) (Spec. 3.1.14)	
	VACUUM SERVICE	
	ANTI CAVITATION TRIM	
PNEUMATIC ACTUATOR	MODEL NO. & SIZE	
	CLOSE AT : OPEN AT (Kg / Cm ² g)	
	*TRAVEL TIME FOR OPEN TO CLOSE, CLOSE TO OPEN	
	*VALVE POSN. ON SIGNAL AIR FAILURE	
	*VALVE POSN. ON SUPPLY AIR FAILURE	
ACCESSORIES	POSITIONER	
	AIR FILTER REGULATOR	
	AIR LOCK RELAY	
	POSITION LIMIT SWITCH	
	POSITION TRANSMITTER	
	SOLENOID VALVE	
	E / P CONVERTER	
	JUNCTION BOX	
	HAND WHEEL (SIDE MOUNTED)	
	LOCAL POSITION INDICATOR	
	ELECTRO PNEUMATIC POSITIONER	

	Technical specification for APRDS CONTROL VALVES (Pneumatically Operated) 2x600 MW SINGARENI TPP				SPECIFICATION NO. PE-TS-381-142-N101				
					VOLUME III				
					SECTION D				
					REV. NO. 00		DATE: 25.07.2012		
					SHEET 2 of 3				
Tag No..... Quantity..... Data Sheet No. PES-145-06-DS2-0									
DATA SHEET C									
DATA SHEET – C FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR) (TO BE FILLED BY THE BIDDER AFTER THE AWARD OF CONTRACT)									
PERFORMANCE OF VALVE	LINEARITY								
	HYTERSIS								
	SENSITIVITY								
	ACCURACY								
SERVICE CONDITION*	SL.+ NO.	LOAD	FLOW (T/HR)	INLET PR. (KG/CM² (A))	OUTLET PR. (KG/CM² (A))	TEMP DEG. C	CALCULATED CV	% VALVE LIFT	VALVE O/L VELOCITY
		VALVE TYPE							
		* MAX SHUT OFF PRESS ((KG/CM ² g)							
		* BODY DESIGN : PRESS ((KG/CM ² g) | TEMP (DEG. C)							
		* IBR FORM III-C							
TOTAL WEIGHT (VALVE + ACTUATOR + ACCESSORIES) KG.									

	Technical specification for Control Valves with Accessories (Pneumatically Operated) 2x600 MW SINGARENI TPP		SPECIFICATION NO. PE-TS-381-142-N101	
			VOLUME II-B	
			SECTION D	
			REV. NO. 00	DATE: 25.07.2012
			SHEET 1 of 1	


Tag No: Applicable for all tag nos.		Quantity: As required		Data Sheet No. PES-145-06-DS1-0	
Applicable for tag nos. wherever statement "REQUIRED" indicated in the individual CV data sheets					
DATA SHEET – A & B for ACCESSORIES DATA SHEET – A FOR CONTROL VALVE (WITH PNEUMATIC ACTUATOR)					(TO BE FILLED UP BY BIDDER)
SMART POSITIONER	MFR. & MODEL NUMBER				
	BYPASS	GAUGES	ENCL. CLASS		
	INPUT SIGNAL				
	OUTPUT SIGNAL (Kg / Cm ²)				
AIR FILTER REGULATOR TWO (2) Nos./CV <=5MICRON (SINTERED BRONZE)	MFR. & MODEL NUMBER				
	AIR SUPPLY PRESS (MAX.) (Kg / Cm ² g)				
	OUTPUT PRESS (Kg / Cm ² g)				
	OUTPUT GAUGE				
AIR LOCK	MFR. & MODEL NUMBER				
	SET PRESS (Kg / Cm ²)				
	SUPPLY PRESS (MAX.) (Kg / Cm ²)				
	RESET TYPE				
	VENT PLUG				
LIMIT SWITCH	MFR. & MODEL NUMBER				
	OPEN posn	INT posn	CLOSE posn		
	CONTACT TYPE				
	RATING (AC / DC)				
	ENCLOSURE CLASS				
POSITION TRANSMITTER	MFR. & MODEL NUMBER				
	TYPE				
	SUPPLY				
	OUTPUT RATING				
	ACCURACY				
	ENCLOSURE CLASS				
SOLENOID VALVE	MFR. & MODEL NUMBER				
	RATING				
	OPERATION	QUANTITY			
	COIL INSULATION CLASS				
	ENCLOSURE CLASS				
JUNCTION BOX	NO. OF WAYS				
	SIZE				
	CABLE GLANDS (Size / Quantity)				
	ENCLOSURE CLASS				
I/P CONVERTER (Part of SMART Positioner)	INPUT SIGNAL	POWER SUPPLY			
	SPLIT RANGE				
	ENCLOSURE CLASS				
	Accuracy	Repeatability			
Cu. Tubing & Fittings / per CV	This is in addition to cu. Tubing and fittings which are integral part of CV as per ASTM B68 to B75 (USA)		15 Meters of ¼ " PVC coated annealed Cu. Tubing, with 1 set of Fittings for each CV for connection to IA Header on one end and accessories on another end of CV.		


	TITLE DATASHEET - C STEAM DESUPERHEATER				SPEC. NO.: PE-TS-381-142-N101	
					VOLUME III PART -A	
	SHEET 1 OF 2					
INSTRUCTIONS TO BIDDER 1. This data sheet shall be read in conjunction with specification No. PES - 148 - 01 Section - D, Volume - II B. 2. Items which deviate from specification shall be marked with an asterisk (*) 3. This data sheet shall be submitted alongwith bid.						
SL.NO.	ITEM	UNIT	PARTICULARS			
1.0	TYPE OF DESUPERHEATER	-				
2.0	MODEL NO.	-				
3.0	NUMBER OFFERED NOS.					
4.0	FLOW CAPACITY (OUTLET OF DESUPERHEATER)	T/HR				
5.0	STEAM PARAMETERS AT INLET					
5.1	PRESSURE	KG/CM ² A				
5.2	TEMPERATURE	°C				
5.3	FLOW T/HR					
6.0	STEAM PARAMETERS AT OUTLET					
6.1	PRESSURE	KG/CM ² A				
6.2	TEMPERATURE	°C				
7.0	SPRAY WATER PARAMETERS					
7.1	PRESSURE	KG/CM ² A				
7.2	QUANTITY	T/HR				
8.0	DESIGN PARAMETERS OF DESUPERHEATER BODY					
8.1	PRESSURE	KG/CM ² G				
8.2	TEMPERATURE	°C				
9.0	DESIGN PRESSURE OF SPRAY NOZZLE	KG/CM ² G				
10.0	TYPE OF SPRAY NOZZLE					
10.1	FIXED / VARIABLE AREA ORIFICE					
10.2	SINGLE HOLE / MULTI HOLE					
Name of Bidder / Vendor					Project	
Revision Number		0	1	2	3	BIDDER'S SEAL
Signature of Bidder / Vendor / Authorised Representative						
Date						


	TITLE DATASHEET - C STEAM DESUPERHEATER				SPECIFICATION NO. PE-TS-381-142-N101	
					VOLUME III PART -A	
	SHEET 2 OF 2					
INSTRUCTIONS TO BIDDER 1. This data sheet shall be read in conjunction with specification No. PES - 148 - 01 Section - D, Volume - II B. 2. Items which deviate from specification shall be marked with an asterisk (*) 3. This data sheet shall be submitted alongwith bid.						
SL.NO.	ITEM	UNIT	PARTICULARS			
11.0	NUMBER OF SPRAY NOZZLE / TURNDOWN RATIO					
12.0	SPRAY WATER NOZZLE CHARACTERISTICS					
13.0	SIZE OF ORIFICE	MM				
14.0	MIN. VELOCITY ACCEPTABLE IN THE DESUPERHEATER PIPE	M/SEC				
15.0	END CONNECTIONS TYPE & SIZE					
15.1	DESUPERHEATER INLET / OUTLET					
15.2	SPRAY WATER INLET					
16.0	MATERIAL OF CONSTRUCTION					
16.1	BODY					
16.2	SPRAY NOZZLE					
17.0	OVERALL DIMENSIONS	MM				
18.0	WEIGHT OF DESUPERHEATER	KG				
19.0	MOUNTING RECOMMENDATIONS (IF ANY)					
20.0	DESIGN CODE					
21.0	HYDRAULIC TEST PRESSURE	KG/CM ² G				
Name of Bidder / Vendor					Project	
Revision Number		0	1	2	3	BIDDER'S SEAL
Signature of Bidder / Vendor / Authorised Representative						
Date						

CHECKLIST — LIST OF SCHEDULES

Sl. No.	Form No.	Description	Tick Applicable Forms
1.	PEM-6024	Schedule of Drawings / Catalogues submitted with Bid	✓
2.	PEM-6025@	Schedule of Occurance of Key Events of Delivery,Erection& Commissioning	
3.	PEM-6026	Schedule of Equipment Manufacture, Despatch and Shipment to Site.	✓
4.	PEM-6027	Schedule of Weights & Dimensions	✓
5.	PEM-6028@	Schedule of Performance Guarantee	
6.	PEM-6030	Inspection Schedule	✓
7.	PEM-6031	Schedule of Cement and Steel and Quarterly Cement Requirement	
8.	PEM-6032	Schedule of Quarterly Requirement of Reinforcing Bars and Structural Steel	
9.	PEM-6033@	Bill of Quantities (Civil Works)	
10.	PEM-6035	Schedule of Bidder's Proposed Construction / Site Fabrication Facilities.	
11.	PEM-6036	Schedule of Deviations	✓
12.	PEM-6040	Schedule of Declaration	✓
13.	PEM-6041	Quality Plan	✓
14.	PEM-6042	Vendor's Drawings / Documents Schedule	✓
15.	PEM-6043@	Schedule of Occurance of Key Events for Civil / Structural Works	
16.	PEM-6046	Inspection Request	✓
17.	PEM-6051	Schedule of Prices	✓
18.	PEM-6052@	Schedule of Unit Prices	✓
19.	PEM-6053	Schedule of Prices for Commissioning & Mandatory Spares	✓
20.	PEM-6054	Schedule of Prices for Recommended Spares	✓
21.	PEM-6055	Schedule Prices for Erection and Maintenance Tools & Tackles	✓
22.	PEM-6056	Schedule of Bidder's Man-power for Supervision of E & C and their Charges.	✓
23.	PEM-6057	Schedule of Daily & Overtime Rates	
24.	PEM-6058	Schedule of Hire-charges for Construction / Site Fabrication Facilities	
For Forms marked with @ certain information to be filled by DEs - before issuing to bidder.			

	TITLE SCHEDULE OF DRAWINGS / CATALOGUES SUBMITTED WITH BID		SPECIFICATION NUMBER PE-TS-381-142-N101	
			VOLUME III PART - A	
			SHEET OF	
Section C/D enclosed with the specification indicate the drawings / catalogues to be furnished with the bid. The bidder in addition to furnishing the same, can also include any other drawings / catalogues which he may desire to submit with the bid. This schedule duly lists out such drawings as enclosed by the bidder with the bid.				
DRAWING./ CATALOGUE NUMBER	DESCRIPTION			NUMBER OF SHEETS
PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				COMPANY SEAL
NAME	DESIGNATION	SIGNATURE	DATE	

	TITLE SCHEDULE OF EQUIPMENT, MANUFACTURE, DESPATCH AND SHIPMENT TO SITE			SPECIFICATION NUMBER PE-TS-381-142-N101	
				VOLUME III PART - A	
				SHEET OF	
Equipment / Major Bought-out Items	Time for Manufacture/ Procurement from Date of Issue of Letter of Intent (Weeks)	Time for Test, Dismantling Packing & Ready for Despatch (Weeks)	Time required for Shipment to Site (Weeks)	Total Time from Date of Issue of Letter of Intent to Shipment to Site (Weeks)	
We, the undersigned hereby undertake to meet the above time schedule in weeks for manufacture, despatch and shipment of each equipment and procurement of major boughtout items as listed above.					
PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE					COMPANY SEAL
NAME	DESIGNATION	SIGNATURE	DATE		

	TITLE <h2 style="text-align: center;">SCHEDULE OF WEIGHTS & DIMENSIONS</h2>		SPECIFICATION NUMBER PE-TS-381-142-N101	
			VOLUME III PART - A	
			SHEET OF	
The bidder shall state below the weights and dimensions of various packages for shipment covering the complete scope.				
Description of Package(s)		Dimensions (in meters)		Weight (in tonnes)
PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL



INSPECTION SCHEDULE

SPECIFICATION NUMBER PE-TS-381-142-N101

P.O.
NUMBER


VOLUME - III PART-A

SHEET OF

S. No.	ITEM/COMPONENT	PLACE & ADDRESS OF TEST / INSPECTION	Scheduled Date of Inspection	Duration of Test / Inspection (in days)

This schedule shall be in line with specification and quality plan requirements. The information in this form shall be furnished after receipt of LOI / PO.

PARTICULARS OF VENDOR's / AUTHORISED REPRESENTATIVE			COMPANY SEAL
NAME	SIGNATURE	DATE	

	TITLE * SCHEDULE OF DEVIATIONS () From Conditions of Contract (Volume - I) () From General Technical Conditions (Volume - II A) () From Technical Specifications (Volume - II B)				SPECIFICATION NUMBER PE-TS-381-142-N101	
					VOLUME III PART - A	
					SHEET OF	
We the undersigned hereby certify that the above mentioned are the only deviations.						
PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE						
NAME	DESIGNATION	SIGNATURE	DATE			
					COMPANY SEAL	



TITLE

SPECIFICATION NUMBER PE-TS-381-142-N101

* SCHEDULE OF DECLARATION

VOLUME III PART - A

SHEET OF

DECLARATION

I,.....certify that all the technical data and information pertaining to this specification are correct and are true representation of the equipment/system covered by our formal proposal number Dated..... and there is no deviation to the specification.

I hereby certify that I am duly authorised representative of the Bidder's company whose name appears above my signature.

Bidders Company Name

Authorised representative's Signature

Name

Bidder's Intent The bidder hereby agrees to fully comply with the requirements and intent of this specifications for the price indicated.

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE

NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL

INSTRUCTIONS FOR FILLING QUALITY PLAN

(Form No. PEM-6042-0)

The Quality Plan shall include all the Quality Control Measures and Checks adopted by the Vendor to ensure that the material/component/assembly/services supplied by him meet/will meet the requirements as per specifications and good practices. They shall include all stages of operation such as materials, processes, manufacture, assembly, packing and despatch. The following guide lines may be noted:

- Column 1- Serial Number
- Column 2- Component/Operation- The component and/or operation being checked shall be given here.
- Column 3- Characteristics check- The characteristics being checked shall be given here, e.g., chemical composition, mechanical properties, leak tightness, surface defects etc..
- Column 4- Category - 'CR' stands for critical characteristic - affecting safety of equipment and personnel
'MA' stands for major Characteristic - affecting safety of equipment and personnel
'MI' stands for minor characteristic - affecting appearance etc.
- Column 5- Type/Method of check e.g. chemical analysis tensile testing, hydraulic test, visual examination radiography etc.
- Column 6- Extent of check, such as, 100, 10, 1 per heat etc.
- Column 7- Reference Documents - Documents, such as technical specification, drawings, standard specifications (IS, BS ETC.) procedure, etc. according to which check is done.
- Column 8- Acceptance Norms - Standards etc. according to which acceptability or otherwise of the characteristics being checked is decided.
- Column 9- Format of Record - Formats, log sheets, reports, etc. in which the observations are recorded. Standard log sheets, reports, formats etc. of the Vendors shall be numbered and such reference numbers shall be included here.
- Column 10- Agency - The agency which performs the test/instruction shall be written in sub-column 'W'
The agency which verifies test certificates/inspection records and carries out audit check of the components/operation shall be written in sub-column 'V'
The agencies are codified '1' stands for (BHEL)
as 1,2 & 3 '1' * means the operation shall be cleared by BHEL before the start of the next operation.
'2' Stands for Vendor
'3' stands for sub-Vendor of the Vendor and so on.

Example :

- Entry '3' in column 'P' means test./inspection to be performed by sub-Vendor's QC
- Entry '2' in column 'W' means test./inspection to be witnessed by Vendor's QC
- Entry '1' in column 'V' means verification shall be done by BHEL and next stage to be started only after the hold point is cleared by BHEL
- Column II- Remarks - Any special remarks shall be given here.

NOTES :

1. In absence of correlation with the test certificate(s) (e.g. material identification) samples shall be drawn by BHEL and all tests as per relevant specifications shall be carried out in their presence or in recognized Government Laboratory.
2. When materials and components are initially identified and stamped by BHEL QS engineer, the identification marks shall be preserved till despatch. Wherever this is not possible, the identification mark shall be transferred to the components in the presence of BHEL QS Engineer unless otherwise agreed.
3. For castings and forgings integral test specimens shall be provided, When this is not possible for casting, they shall be poured in the presence of BHEL QS Engineer unless otherwise, if witnessing of test by BHEL is called for.
4. When welders qualified by reputed inspection agencies or statutory bodies are not available, qualification tests shall be conducted in the presence of BHEL QS Engineer.
5. This Quality Plan is liable to be modified as per the requirements of approved drawings and changes in technical specifications/drawings. If there are contradictions in respect of column 7 & 8 between this Quality Plan and the approved drawings specifications, the latter shall prevail.
6. Wherever inspection by BHELs Purchaser/Third Party/Statutory authorities are mandatory, this shall be complied with.
7. Inspection reports, log sheets, test reports/certificate. etc. shall be furnished to BHEL at the appropriate stages or at the time of final inspection, as required.
8. This Quality Plan is also applicable to spares, if any, under scope of supply of Vendor.
9. The quality plan shall be submitted in septuplicate (7 Copies).

INSPECTION REQUEST

(From Vendor to BHEL Inspection Agency)

1 PROJECT TITLE:**2 NAME OF VENDOR:****3 BHEL'S LOI / PO NO:****DATE :****4 SYSTEM / ITEM DESCRIPTION****5 ITEMS BEING OFFERED FOR INSPECTION WITH SL. NO. AS PER LOI / PO / BILLING SCHEDULE****6 DESCRIPTION AND SL. NO. OF INSPECTION AS PER QUALITY PLAN****7 QUANTITY OFFERED FOR INSPECTION****8 PLACE OF INSPECTION (FULL ADDRESS AND NAME OF SUB-VENDOR, IF ANY)**

PLACE

ADDRESS

.....
.....**9 CONTACT PERSON (FOR SL. NO. 8 ABOVE).**

NAME DESIGNATION

TELEPHONE

FAX TELEGRAM

TELEX

10 THE FOLLOWING DOCUMENTS ARE APPROVED BY BHEL AND AVAILABLE AT PLACE OF INSPECTION

(A) QUALITY PLAN (B) DRAWINGS (C) DATA SHEETS, CHARACTERISTIC CURVES ETC. (D) PLANT STANDARDS

11 REQUIRED DATE OF INSPECTION LIKELY DURATION (No of Working days).....

WEEKLY OFF DAY WORKING HOURS

(At least 15 days prior notice shall be given by the Vendor to Inspection Agency)

We hereby certify that the above items are complete in all respects and have been fully inspected/tested by us and are found to be as per technical specification/approved drawings/data sheets/characteristic curves and are acceptable to our QC department. The detailed inspection and test reports of our QC department are enclosed.

VENDOR'S PARTICULARS

NAME	DESIGNATION	SIGNATURE	PLACE	DATE	COMPANY SEAL



TITLE

**AUXILIARY STEAM PRESSURE REDUCING
& DESUPERHEATING STATION**

SPEC. NO.: PE-TS-381-142-N101


VOLUME **III**

SECTION **PART-B**

REV NO. **0** DATE 25.07.2012

SHEET 1 OF 1

**VOLUME-III
PART-B
PRICE SCHEDULES**

	TITLE SCHEDULE OF PRICES AUXILIARY STEAM PRESSURE REDUCING & DESUPERHEATING STATION	SPEC. NO.: PE-TS-381-142-N101	
		VOLUME III	
		SECTION PART-B	
		REV NO. 0	DATE 25.07.2012
		SHEET 1 OF 1	

S.No.	Description of Works or Equipment/System	Price (in Lakhs of Rs.)
1.0	Total price for design, manufacture, assembly, inspection, testing, packing and dispatch to site of auxiliary steam pressure reducing and desuperheating stations complete with desuperheaters, controls valves and all accessories including commissioning spares and special tools & tackles as specified and necessary as per technical specification PE-TS-381-142-N101	
2.0	Mandatory spare, item wise breakup with item wise price to be given as per schedule of Mandatory spare enclosed under vol. III of tech. specification. Price not to be included in clause 1.0 above	
3.0	Recommended spares, item-wise break up with item-wise price to be given as per “Schedule of Recommended Spares” enclosed under Vol. III of technical specification- price not to be included in clause 1.0 above, Bidder to indicate the break up.	
4.0	Optional price of supervision of erection and commissioning of equipments – prices not to be included in clause 1.0 above. Indicate all duties, taxes etc. Stating whether included/excluded in above price.	
-Bidder shall furnish this price schedule in his price offer only.		
-		
PARTICULARS OF VENDOR's/AUTHORISED REPRESENTATIVE		



TITLE

SCHEDULE OF UNIT PRICES

AUXILIARY STEAM PRESSURE REDUCING & DESUPERHEATING STATION

SPEC. NO.: PE-TS-381-142-N101


VOLUME **III**

SECTION **PART-B**


REV NO. **0** DATE 25.07.2012


SHEET OF


S.No.	Item Description	Unit Price (in Lakhs of Rs.)
1.0	Design, manufacture, inspection & testing, packing and delivery for site for following as specified in Technical specification PE-TS-381-142-N101:	
1.1	Unit Price of Control valves (2X600 MW, SINGARENI TPP) <ul style="list-style-type: none"> a) Combined Type HC-PRDS (from MS Line) (ASV-22) b) Low Capacity Pressure Reducing Valve (from CRH line) (ASV-65) c) HC PRDS Pressure Control Spray Valve (FDV-53) d) HC PRDS Temp. Control Spray Valve (FDV-54) e) Bypass to FDV-53 (FDV-58) f) Bypass to FDV-54 (FDV-59) g) DESH-2 Pressure Control Spray Valve, (FDV-62) h) DESH-2 Temp. Control Spray Valve, (FDV-63) i) Bypass to FDV-62 (FDV-67) j) Bypass to FDV-63 (FDV-68) k) Block Spray Valve, FDV-51 l) LT Desuperheater (DESH-2) 	
1.2	Price of Mandatory Spares (item wise) (as per cl. No. 5.1.0 of Section-C, Part-II B), Item Wise Price Break-up	

		TITLE * SCHEDULE OF PRICES FOR COMMISSIONING AND MANDATORY SPARES				SPECIFICATION NUMBER PE-TS-381-142-N101			
						VOLUME III			
						SHEET OF			
The bidder shall indicate here the quantity required for erection / commissioning and mandatory spares for equipment as listed in Section-C / Section - D. If the listed spares are not adequate, then the bidder shall indicate those and additional spares considered necessary by him.									
Type	Manufacturer's Drawing No. / Part of spare	Description	Material	Quantity per Unit / Equipment	Quantity Required	If set, Nos. Per set	Delivery period (Weeks)	Unit Price (Rs.)	Total Price (Rs.)
Erection and Commissioning									
Mandatory Spares									
Additional Spares Mandatory Erection / Commissioning									
PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE									
NAME	DESIGNATION	SIGNATURE	DATE						

COMPANY SEAL

		TITLE * SCHEDULE OF PRICES FOR RECOMMENDED SPARES				SPECIFICATION NUMBER PE-TS-381-142-N101			
						VOLUME III			
						SHEET OF			
The bidder shall give below a list of spares recommended for three years (or as otherwise specified in section - C) for trouble free performance of the equipment / system offered.									
S. No.	Manufacturer's Drawing No. / Part of spare	Description	Material	Quantity per Unit / Equipment	Quantity recommended	If set, Nos. Per set	Delivery period (Weeks)	Unit Price (Rs.)	Total Price (Rs.)
PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE									
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL					

	TITLE SCHEDULE OF PRICE FOR ERECTION AND MAINTENANCE TOOLS & TACKLES		SPECIFICATION NUMBER PE-TS-381-142-N101	
			VOLUME III	
			SHEET OF	
The bidder shall be give below the list of erection and maintenance tools and tackles as offered by him. This shall also include the customer's list of maintenance tools, if specified in Section - C / Section - D.				
S. No.	Description of Tools & Tackles	Quantity offered	Unit Price (Rs.)	Total Price (Rs.)
NOTE : The hire charges for vendor's equipment called for in this schedule shall include the cost of consumables, operation services, depreciation, wear and tear as well as vendor's over head and profit. (These rates will be payable by customer to the vendor, only if the customer's requires the use of this equipment for carrying out his own work out side the scope of this contract.)				
PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				COMPANY SEAL
NAME	DESIGNATION	SIGNATURE	DATE	

	TITLE			SPECIFICATION NUMBER PE-TS-381-142-N101	
	SCHEDULE OF BIDDER'S MAN POWER FOR SUPERVISION OF E & C AND THEIR CHARGES			VOLUME III	
				SHEET OF	
The bidder shall indicate below, designation-wise, the personnel required for supervision of erection and commissioning and their charges.					
SUPERVISION OF ERECTION					
S. No.	Designation	Normal rate per day of 8 hours		Overtime rate per hour	
SUPERVISION OF COMMISSIONING					
Sl. No.	Designation	Normal rate per day of 8 hours		Overtime rate per hour	
PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE					COMPANY SEAL
NAME	DESIGNATION	SIGNATURE	DATE		