

2X660MW OPGC BANHARPALLI TPS

VOLUME – IIB

TECHNICAL SCHEDULES

FOR

SPRING LOADED BYPASS VALVES

SPECIFICATION NO. PE-TS-391-100-M009



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

	TITLE:	SPECIFICATION NO. PE-SS-999-100-Q001	
	<b>PREAMBLE</b>	VOLUME :	
		SECTION :	
		REV. NO. :	DATE: 26.08.2011
		SHEET 1 of 1	

1.0 The tender document contains three (3) volumes. The bidder shall meet the requirements of all the three volumes.

1.1 **Volume-I (CONDITIONS OF CONTRACT)**

This consists of four parts as below:-

- Volume-IA : This part contains instructions to bidders for making bids to BHEL.
- Volume-IB : This part contains general commercial conditions of the tender & includes provision that vendor is responsible for the quality of item supplied by their sub-vendors.
- Volume-IC : This part contains special conditions of contract.
- Volume-ID : This part contains commercial conditions for erection & commissioning site work, as applicable.

1.2 **Volume-II (TECHNICAL SPECIFICATIONS)**

Technical requirements are stipulated in Volume-II which comprises of:-

- Volume-IIA : General Technical Conditions
- Volume-IIB : Technical Specification including Drawings, if any.

1.2.1 **Volume-IIB**

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 technical requirements specific to the contract, not covered in Section-D.
- Section-D : This section comprises of technical specifications of equipment complete with data sheet A, B and C.

- Data Sheet-A** Specifies data and other requirements pertaining to the Equipment.
- Data Sheet-B** Specifies 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).

1.2.2 **Volume-III (TECHNICAL SCHEDULES)**

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.

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:  
TECHNICAL SPECIFICATION  
SPRING LOADED BYPASS VALVES  
2X660MW OPGC BANHARPALLI TPS

SPECIFICATION NO. PE-TS-391-100-M009

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# SECTION-A

## SCOPE OF ENQUIRY

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	TECHNICAL SPECIFICATION	VOLUME : IIB	
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## SCOPE OF ENQUIRY

### 1. SCOPE

This enquiry covers the Design, Manufacture, Inspection & Testing at vendor's and/or his sub-vendor's works, proper packing and delivery to site of Spring loaded bypass valve complete with all accessories as per the requirements mentioned in different sections of the specification for 2X660MW OPGC BANHARPALLI TPS.


### 2. GENERAL TECHNICAL INSTRUCTIONS

- a) 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 Engineer/ Owner, who will interpret the meaning of drawing and specifications, and shall be entitled to reject any component or material, which in his judgement is not in full accordance herewith.
- b) The omission of specific reference to any component/ accessories necessary for the proper performance of spring loaded bypass valve shall not relieve the bidder of the responsibility of providing such facilities to complete the supply of spring loaded bypass valve at quoted prices.
- c) Design/ drawings/ data sheets etc. shall be subject to approval of BHEL as per specification, in the event of order.
- d) BHEL's / customer's representative shall be given access to the shop in which the equipment are being manufactured or tested and all test records shall be made available to him.
- e) The equipment covered under this specification shall not be despatched unless the same have been finally inspected, accepted and shipping release issued by BHEL.

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## SECTION-B


### PROJECT INFORMATION

	TITLE:	SPECIFICATION NO. PE-TS-391-100-M009	
	TECHNICAL SPECIFICATION	VOLUME : IIB	
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	2X660MW OPGC BANHARPALLI TPS	REV. NO. : 00	DATE: 02.07.2014
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### PROJECT INFORMATION

Project information will be provided later. The bidder shall acquaint himself by a visit to the site, if felt necessary, with the conditions prevailing at site before submission of the bid. The information provided in this section will be for general guidance and shall not be contractually bidding on BHEL/OWNER. All relevant site data/information as may be necessary shall have to be obtained/collected by the bidder.

The plant site is located in Banharpalli, Jharsuguda district, Orissa.

	<b>TITLE:</b> <b>TECHNICAL SPECIFICATION</b> <b>SPRING LOADED BYPASS VALVES</b>	SPECIFICATION NO. PE-TS-391-100-M009	
		VOLUME : IIB	
		SECTION : C	
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## SECTION-C

### SPECIFIC TECHNICAL REQUIREMENTS



TITLE:  
SPECIFIC TECHNICAL REQUIREMENTS  
SPRING LOADED BYPASS VALVES  
2X660MW OPGC BANHARPALLI TPS

SPECIFICATION NO. PE-TS-391-100-M009  
VOLUME :  
SECTION : C  
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## 1. GENERAL

1.1 The valves shall meet the technical requirements and conform to the standard technical specification and Data sheet A of Section D. In addition, the requirements of this Section-C shall also be complied with. However, wherever the details given in standard technical specification of Section-D and Data sheet A are different, the requirements of Data sheet A shall prevail. Similarly in the event of contradictions between Sections –C & Section –D/ Data sheet A, Section –C will prevail.

1.2 The technical requirements for valves shall, in general, be as per the attached standard Technical specification for Valves and Data sheet A of Vol. II B Section D.

## 2. SCOPE OF SUPPLY

2.1 The valves complete with all accessories shall be supplied as per Data sheet A of Section D. For detail refer the same. Each valve (quantity and other details specified in Data Sheet-A) shall be complete with the following accessories.

i) Lifting arrangement provision for handling i.e., lifting lugs, eye bolts etc.

2.2 Commissioning spares, if any.

2.3 Set of special tools and tackles if required for the maintenance, erection etc. of the equipment supplied.

2.4 Mandatory spares as applicable depending upon the project requirement.

2.5 Finish paints for touch-up painting of equipment after erection at site in sealed containers.

2.6 Various drawings, datasheets, operation and maintenance manuals etc., as specified in Data Sheet-C.

## 3 EXCLUSIONS:


Erection & Commissioning at site are excluded from the bidder's scope.

## 4 QUALITY ASSURANCE

The Quality Plans enclosed with this specification specify minimum quality control requirement. During contract stage vendor shall furnish these Quality Plans duly signed & stamped for their compliance. Quality plans shall be approved by BHEL and customer (If necessary). All inspection and testing shall be carried out by BHEL and CUSTOMER (if necessary). In case inspection is by both BHEL and CUSTOMER, then the inspection can be carried out jointly or separately, which will be informed later.

## 5 PAINTING REQUIREMENT:

Surface preparation shall be as per SSPC-SP-3/ Power Tool Cleaning followed by two coats of Heat Resistance Aluminium paint to IS 13183 Gr. I or equivalent, paint shade Aluminium and total DFT of paint will be equal to 80 microns minimum.

	TITLE:	SPECIFICATION NO. PE-TS-391-100-M009	
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	SPRING LOADED BYPASS VALVES	SECTION : C	
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## 6 PACKING INSTRUCTIONS:

- a) Each valve shall be drained, cleaned, prepared and suitably protected in such a way so as to minimize the possibility of damage and deterioration during transit and storage.
- b) The valve has to be dispatched in total assembled form.
- c) Body ends shall be suitably sealed to protect them against damage during transit and storage.
- d) Valves with butt-welding ends shall be protected by means of polythene caps/rubber end protectors to prevent damage to ends & also to avoid foreign material entering the valve during shipment & storage.
- e) Valve Tag Nos. shall be incorporated in all the dispatch documents.
- f) Proper care shall be taken to avoid damage to the painted surface during transit.
- g) All the valves shall be packed suitably in wooden cases in order to avoid damage during transit and also during storage at site in tropical climate conditions for a period of 15-18 months.
- h) Vendor to provide soft copy of photos/snaps of duly packed valve. The soft copies to be provided by vendor after final inspection of valves. Clearance for dispatch of valves will be given only after satisfactory packing conditions of valves from vendors work.
- i) Spare parts shall be packed separately and clearly marked. Spares shall also be suitably packed for transit and long storage period at site.

## 7 SPARES


- a) **Mandatory Spares:** These shall be as per Data Sheet-A.
- b) ~~**Recommended Spares:** List of recommended spares for 3 year reliable operation along with the unit price shall be indicated in the schedule of prices for recommended spares enclosed in Volume-III. Cost of Recommended spares shall not be included in the base price.~~
- c) Order for the spares may be placed simultaneously or otherwise at the option of purchaser.

## 8 DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER

Bidder shall submit the following documents (enclosed in Vol. III) duly filled, signed and stamped along with the bid:


- a) Compliance sheet
- b) Schedule of Deviations if any.
- c) Schedules of Price & Unit Price for each project.
- d) Schedule of declaration.

The above are the only documents which will be used for technical evaluation unless other documents are asked for during technical clarifications. Any other technical document enclosed with the bid shall be ignored for the purpose of technical evaluation. All other documents attached with the specification are for information of the vendor and no comments shall be marked on these.

	<b>TITLE:</b> <b>TECHNICAL SPECIFICATION</b> <b>SPRING LOADED BYPASS VALVES</b>	SPECIFICATION NO. PE-TS-391-100-M009	
		VOLUME : IIB	
		SECTION : D	
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## SECTION-D

# STANDARD TECHNICAL SPECIFICATION DATA SHEET – A QUALITY PLAN DATA SHEET – C

	TITLE:	SPECIFICATION NO. PE-SS-999-100-M009	
	STANDARD TECHNICAL SPECIFICATION	VOLUME : IIB	
	SPRING LOADED BYPASS VALVES	SECTION : D	
	2X660MW OPGC BANHARPALLI TPS	REV. NO. : 02	DATE: 15.05.2012
		SHEET 1 of 2	

## 1.0 GENERAL

1.1 This specification covers the design, materials, construction features, manufacture and testing of Spring Loaded Bypass valves at Vendor's or/ and sub-Vendor's works inclusive of painting and packing requirements.

## 2.0 CODES AND STANDARDS:

2.1 The valves covered under this specification shall be of manufacturer's own proven design and shall be suitable for the required technical parameters mentioned in Data sheet A. However BS: 759 and BS EN ISO 4126 shall be referred to wherever applicable.

2.2 In case of any conflict between the above Codes/Standards and this specification, the latter shall prevail and in case any further conflict in this matter, the interpretation of the specification by the Engineer shall be final & binding.

## 3.0 DESIGN REQUIREMENTS

3.1 All valves shall be suitable for the service conditions i.e. flow, temperature and pressure under which they are required to operate and those performing similar duties shall be interchangeable with each other unless otherwise specified.

## 4.0 MATERIALS

4.1 The materials of construction of main parts of valves shall be specified in Data sheet-A.

4.2 The materials of construction of the remaining parts shall be as per relevant code/ standard governing the valves and to suit the service conditions. These materials shall be subject to approval of the purchaser.

4.3 Materials used in manufacture of valves shall be of tested quality.

## 5.0 CONSTRUCTION FEATURES:

5.1 All valves shall be globe type construction.

5.2 The seat and disc shall be easily removable and shall be suitable for easy relapping.

5.3 Valves shall have pressure seal bonnet / bolted bonnet construction and the adjusting screw shall be covered under a cap.

5.4 An arrow indicating the direction of flow shall be embossed on the body of the valves.

5.5 A metallic (stainless steel plate 2mm thick) nameplate shall be fitted on each valve. Nameplate inscription required for each valve shall be indicated at the contract stage. Inscriptions shall be engraved 1 mm deep filled with enamel paint.


5.6 Suitable lifting lugs and eye bolts shall be provided for valves of weight 500 Kg and above.

## 6.0 LUBRICATION:

6.1 Lubrication, if any, required for smooth and easy operation of valves shall be mentioned.

6.2 Choice of lubrication shall be based on ambient temperature condition of 50°C.

6.3 Type of lubricant to be used and its annual consumption (based on 100 operations per year) shall be indicated by the tenderer.

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## 7.0 INSPECTION AND TESTS:


- 7.1 The items covered under this contract shall be subjected to inspection, testing and quality surveillance. The Inspection Agency shall, at all reasonable times have access to Vendor's works, Quality Control records and all facilities as reasonably required for carrying out the inspection and testing efficiently, and these shall be provided by the vendor free of cost
- 7.2 Valves coming under the purview of IBR shall be inspected by Independent Inspecting authority approved by Indian Boiler Board and the test Certificate in IBR Form III-C duly countersigned shall be submitted. The Independent Inspecting Authority proposed by the vendor shall be informed in the offer.
- 7.3 The minimum NDT/testing and inspection requirements for valve shall be as per the attached Quality Plan. However, in case of order, final inspection and testing shall be carried out as per the final approved quality plan without any price implications.
- 7.4 Body of all valves shall be hydraulically tested at 1.5 times the design pressure for leak tightness.

## 8.0 PAINTING

- 8.1 The surface preparation of all exterior and interior surfaces of valves shall include the following:
- 8.1.1 Removal of oil, grease and dirt.
  - 8.1.2 Removal of rust and scale etc.
  - 8.1.3 Sand blasting/ shot blasting.
- 8.2 All exterior surfaces of valves shall be painted with primer and finish coated with coating of min. 150 microns thickness. Color shade etc. shall be subject to BHEL/ Customer approval.

## 9.0 CLEANING AND PROTECTION FOR DESPATCH

- 9.1 Suitable rust preventive shall be applied on machined exposed surfaces.
- 9.2 Valve ends shall be protected from external damage and sealed against the ingress of dirt by means of polythene caps/rubber end protectors.
- 9.3 Valve Tag Nos. shall also be incorporated in all the dispatch documents.

	TITLE:	SPECIFICATION NO. PE-TS-391-100-M009	
	DATA SHEET - A	VOLUME : IIB	
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**REQUIREMENT OF SPRING LOADED BYPASS VALVE  
BILL OF MATERIAL FOR MAIN & SPARES**

DESCRIPTION	QUANTITY (NOS)			MANDATORY SPARES (COMPLETE ASSEMBLY WITHOUT COMMISSIONING SPARES) (NOS)
	MAIN VALVE(NOS.)	COMMISSIONING SPARES		
		BONNET GASKET (NOS)	CAP GASKET (NOS)	
SPRING LOADED BYPASS VALVE				
FDV-35	2	2	2	1
FDV-36	2	2	2	

<b>BHEL PEM</b>	DOCUMENT TITLE	DOCUMENT NUMBER	PE-DC-391-100-N307
	<b>DATA SHEET FOR SPRING LOADED BYPASS VALVE ACROSS HP HEATERS</b>	REVISION NUMBER	01 DATE 17/06/2013
	<b>2x660 MW OPGC BANHARPALLI TPS</b>	SHEET	2 OF 3

### 1.0 GENERAL DESCRIPTION

Two banks of HP Heaters of 50% capacity on feed water side are installed in the regenerative feed cycle i.e. HPH-6A/7A/8A & HPH 6B/7B/8B. Each heater bank is provided with motor operated gate valves at the inlet & outlet. The two (2) feed water bypass lines, of 50% capacity each, are provided across HP Heater banks with spring loaded bypass valve (SLBV) **FDV-35 & FDV-36** for facilitating individual as well as both heater banks isolation due to any operational problem. Each SLBV is sized to pass 50% of BMCR feed water flow and works on differential pressure across the valve. Each SLBV has a staggered set pressure so that it acts as a back protection.

### 2.0 TECHNICAL REQUIREMENTS

1.	Quantity	:	2 nos. / unit, Tagged <b>FDV-35 &amp; FDV-36</b> (Total four nos. for two units).
2.	Type	:	Globe type spring loaded bypass valve.
3.	Size of valve	:	To be decided by bidder based on sizing data.
4.	a) End connection b) Connecting pipe material	:	Butt welded. SA 106 GrC
5.	No. of Heater banks.	:	2 nos.
6.	Pressure drop across each heater bank.	:	3.65 kg/cm <sup>2</sup> at 960 T/Hr
7.	Operating conditions.	:	FDV-35: valve shall pass 1100 T/Hr of feed water at <b>193.4°C &amp; 310.4</b> kg/cm <sup>2</sup> (a). Set pressure 5.0 kg/cm <sup>2</sup> . Fully opens at 10% over pressure.  FDV-36: valve shall pass 1100 T/Hr of feed water at <b>193.4°C &amp; 310.4</b> kg/cm <sup>2</sup> (a). Set pressure 5.4 kg/cm <sup>2</sup> . Fully opens at 10% over pressure.
8.	Set pressure range	:	Each valve shall be adjustable for opening when differential pressure settings are 3.65 to 5.6 kg/cm <sup>2</sup> .
9.	Design pressure and temperature	:	335 kg/cm <sup>2</sup> (a) and 310°C
10.	Valve body Material	:	ASTM A216 WCC
11.	Regulatory requirement	:	IBR certificate in form IIIC

**3.0** Testing, Mandatory spares and all other general requirements shall be as per contract.

**4.0** Bidders to offer the minimum size of SLBV meeting the above mentioned parameters in totality and note that the reducers for connecting this valve with the connecting pipe size will be taken care by BHEL itself, if required.



TITLE:  
DATA SHEET-A  
SPRING LOADED BYPASS VALVES  
2X660MW OPGC BANHARPALLI TPS

SPECIFICATION NO. PE-TS-391-100-M009  
VOLUME : IIB  
SECTION : D  
REV. NO. : 00      DATE: 11.04.2014  
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**MATERIAL OF CONSTRUCTION**

SNO	COMPONENT	MATERIAL
1	BODY, BONNET, CAP	ASTM A216 Gr. WCC
2	STEM	ASTM A182 Gr. F6a
3	SPRINGS	ALLOY STEEL
4	BODY SEAT	ASTMA 105 Hard Faced (Stellite or Equivalent)
5	BONNET BUSH & LOCK NUT, ADJUSTING SCREW	PHOSPHER BRONZE (ASTM B139 / BS1400)
6	BOTTOM & TOP SPRING PLATE	STAINLESS STEEL (BS970-420 / ASTM276-420)
7	BODY & CAP STUD	ASTM A193 Gr. B7
8	BODY & CAP NUT	ASTM A194 Gr. 2H
9	BONNET & CAP GASKETS	SPIRAL WOUND GASKETS
10	VALVE HEAD	NICKLE CHROME ALLOY/ Seating Surface Hard Faced (Stellite or Equivalent)
11	VALVE GUIDE	NICKLE CHROME ALLOY

	<b>QUALITY PLAN</b>		CUSTOMER: OPGCL			PROJECT: 2X660MW OPGC BANHARPALLI TPS			SPEC. NO :PE-SS-999-100-M009			
			BIDDER/VENDOR			QP NUMBER: PE-QP-391-100-M012			SPEC. TITLE : TECH. SPEC. SLBV			
	SHEET 1 OF 3		SYSTEM <b>FEED WATER</b>			ITEM: <b>SPRING LOADED BYPASS VALVE</b>			SECTION-C		VOLUME- IIB	
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
									P	W	V	


1.0	<b>MATERIALS</b>											
1.1	BODY, BONNET, CAP, SPINDLE, DISC, BODY SEAT, SPRING PLATES, FASTENERS	1. PHYSICAL, CHEMICAL PROPERTIES	MA	PHYSICAL, CHEMICAL TESTS	ONE/HEAT / HEAT BATCH	APPROVED DRG./TECH. SPEC.	APPROVED DRG/ TECH SPEC	TEST CERT	3/2	2	1	-CORRELATION REQUIRED FOR BODY, BONNET, CAP, DISC, SPINDLE
		2. DIMENSION	MA	MEASUREMENT	100%	-DO	-DO	-DO-	3/2	2	1	
		3. HEAT TREATMENT	MA	HT CHART REVIEW VISUAL	100%	-DO-	-DO-	HT CHART	3/2	2	1	
		4. SURFACE DEFECTS	MA	HT CHART REVIEW VISUAL	100%	MSS-SP-55	MSS-SP-55	INSPN. REPORT	3/2	2	1	
1.2	BODY, BONNET, CAP, BODY SEAT	1. SURFACE DEFECTS	CR	PT/MT	100%	ASTME 165/ASTME 709	ASTME 165/ASTME 709	TEST CERT.	3/2	2	1	-FILM REVIEW FOR RT & WITNESSING FOR UT -CERTIFICATE OF COMPLIANCE TO BE FURNISHED --DO--
		2. SUB-SURFACE DEFECTS	CR	RT/UT	100%	ANSI B16.34/TECH SPEC	ANSI B16.34/TECH SPEC	INSPN REPORT	3/2	2,1	2,1	
1.3	SPRING & VALVE GUIDE	1. PHYSICAL, CHEMICAL PROPERTIES	MA	PHYSICAL, CHEMICAL TESTS	100%	APPROVED DRG./TECH. SPEC.	APPROVED DRG/ TECH SPEC	TEST CERT	3/2	2	1	
1.4	BONNET BUSH & ADJUSTING SCREW	1. CHEM PROPERTIES	MA	CHEM. TESTS	100%	APPROVED DRG./TECH. SPEC.	APPROVED DRG/ TECH SPEC	TEST CERT	3/2	2	1	
1.5	SPRING	1. ENDURANCE	CR	ENDURANCE TEST	1/BATCH	RELEVANT SPEC./BS:759	RELEVANT SPEC.	-DO-	3/2	2	1	
		2. SPRING RATE	CR	LOAD TEST	1/BATCH	APPROVED DRG./MFR. STANDARD	APPROVED DRG./MFR. STANDARD	-DO-	3/2	2	1	
		3. SCRAGGING	CR	FULL DEFLECTION	100%	RELEVANT SPEC.	NO PERMANENT SET IN 10 CYCLES	-DO-	3/2	2	1	
		4. SURFACE DEFECTS	CR	PT/MT	100%	ASTME 165/ASTME-709	NO DEFECTS	-DO-	3/2	2	1	
2.0	<b>IN PROCESS CONTROL</b>											
2.1	MACHINING OF BODY,BONNET, CAP, DISC, BODY	1. DIMENSIONS	MA	MEASUREMENT	100%	MFG DRG	MFG DRG.	INSPN. REPORT	3/2	2	1	

<b>BHEL</b>			PARTICULARS		BIDDER/VENDOR						
			NAME								
			SIGNATURE								
			DATE						BIDDER'S/ VENDOR'S COMPANY SEAL		

	<b>QUALITY PLAN</b>		CUSTOMER: OPGCL			PROJECT: 2X660MW OPGC BANHARPALLI TPS			SPEC. NO :PE-SS-999-100-M009			
			BIDDER/VENDOR			QP NUMBER: PE-QP-391-100-M012			SPEC. TITLE : TECH. SPEC. SLBV			
	SHEET 2 OF 3		SYSTEM <b>FEED WATER</b>			ITEM: <b>SPRING LOADED BYPASS VALVE</b>			SECTION-C		VOLUME- IIB	
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY P W V			REMARKS

	SEAT, SPINDLE, SPRING PLATE ETC.	2 SURFACE FINISH 3. SURFACE DEFECTS <b>(PRESSURE PARTS)</b>	MA CR	VISUAL PT/MT	100% 100%	-DO- ASTME 165/ ASTME 709	-DO- ASTME 165/ ASTME 709	-DO- -DO-	3/2 3/2	2 2	1 1	
2.2	SS DEPOSIT ON DISC/BODY SEAT	WELD DEPOSIT	MA	VISUAL	100%	INTERNAL STANDARD	INTERNAL STANDARD	LOG BOOK	3/2	2	1	
2.3	DISC SEAT , BODY SEAT & VALVE GUIDE	1. HARDNESS 2. CONTACT PATTERN 3. SURFACE DEFECTS	MA MA CR	HARDNESS TEST BLUE MATCHING PT/MT	100% ] 100% ]	APPROVED DRAWING/ TECHNICAL SPEC ASTME 165.	APPROVED DRAWING/ TECHNICAL SPEC NO DEFECTS	TEST CERT. -DO-	3/2 3/2	2 2	1 1	
2.4	SPINDLE	1. SURFACE DEFECTS 2. HARDNESS	CR MA	PENETRANT TEST MEASUREMENT	100% 100%	ASTME 165 APPD DRG.	NO DEFECT APPD DRG.	TEST CERT. INSPN REPORT	3/2 3/2	2 2	1 1	
3.0	ASSEMBLY TESTING	1. DIMENSIONS 2. BODY LEAK TIGHTNESS 3. SEAT LEAK TIGHTNESS 4. PRESSURE SETTING	MA CR CR CR	MEASUREMENT HYDRAULIC HYDRAULIC HYDRAULIC	100% 100% 100% 100%	APPROVED DRAWING APPROVED DRAWING/ TECHNICAL SPEC. -DO- SMOOTH OPERATION, VALVE TO OPEN AT SET PRESSURE	APPROVED DRAWING NO LEAKAGE NO LEAKAGE	INSPN REPORT TEST CERT. & IBR III-C TEST CERT. -DO-	3/2 3/2 3/2 3/2	2,1 2,1 2,1 2,1	- - - -	
4.0	<b>END CONNECTION (FOR B.W. ENDS)</b>	1. DIMENSIONS 2. SURFACE DEFECTS	MA CR	MEASUREMENT PENETRANT TEST	100% 100%	APPROVED DRAWING/ TECHNICAL SPEC. ASTME 165	APPROVED DRAWING/ TECHNICAL SPEC. NO DEFECTS	INSPN. REPORT TEST CERT.	3/2 3/2	2 2	1 1	
5.0	<b>FINAL INSPECTION</b>	CLEANLINESS AND COMPLETENESS	MA	VISUAL	100%	APPROVED DRAWING/ DRAWING/ DRAWING/	APPROVED DRAWING/ DRAWING/ DRAWING/	INSPN. REPORT	3/2	2	1	

<b>BHEL</b>		<b>PARTICULARS</b>	<b>BIDDER/VENDOR</b>	
		NAME		
		SIGNATURE		
		DATE		
				<b>BIDDER'S/ VENDOR'S COMPANY SEAL</b>

	<b>QUALITY PLAN</b>			CUSTOMER: OPGCL			PROJECT: 2X660MW OPGC BANHARPALLI TPS			SPEC. NO :PE-SS-999-100-M009		
				BIDDER/VENDOR			QP NUMBER: PE-QP-391-100-M012			SPEC. TITLE : TECH. SPEC. SLBV		
	SHEET 3 OF 3			SYSTEM <b>FEED WATER</b>			ITEM: <b>SPRING LOADED BYPASS VALVE</b>			SECTION-C VOLUME- IIB		
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY P W V			REMARKS

						TECHNICAL SPEC.	TECHNICAL SPEC.					
6.0	<b>PAINTING</b>	QUALITY AND THICKNESS OF PAINT	MA	VISUAL & MEASUREMENT	100%	-DO-	-DO-	-DO-	3/2	2	1	
7.0	<b>PACKING</b>	AS PER TECHNICAL SPECIFICATION	MA	VISUAL	100%	TECHNICAL SPEC.	TECHNICAL SPEC.	(Soft copy of photographs)	3/2	2	1	Photographs of valves after packing to be verified by BHEL before issuing MDCC.

**ABBREVIATIONS**

**CR** = CRITICAL CHARACTERISTIC  
**MA** = MAJOR CHARACTERISTIC


**P** = PERFORMED BY  
**1** = BHEL & CUSTOMER/THIRD PARTY

**W=** WITNESSED BY  
**INSPECTION AGENCY**

**V = VERIFIED BY**  
**2= VENDOR**

**3 = SUB VENDOR**

<b>BHEL</b>	PARTICULARS	BIDDER/VENDOR	
	NAME		
	SIGNATURE		
	DATE		
			BIDDER'S/ VENDOR'S COMPANY SEAL

	TITLE:	SPECIFICATION NO. PE-TS-391-100-M009	
	TECHNICAL SPECIFICATION	VOLUME : IIB	
	SPRING LOADED BYPASS VALVES	SECTION : D	
	2X660MW OPGC BANHARPALLI TPS	REV. NO. : 00	DATE: 02.07.2014
		SHEET 1 of 1	

### DATA SHEET - C

Drawings/documents distribution schedule to be followed by the successful bidder:

1. The successful bidder shall submit the following drawings/documents within two weeks after award of contact.
  - 1.1. Relevant drawings/leaflets for the valves showing following information.
    - 1.1.1. Complete cross sectional arrangement of the valve.
    - 1.1.2. Binding dimensions, dismantling clearances & weights.
    - 1.1.3. Bill of material incorporating all the materials of construction of various parts along with BS/ASTM/IS standards to which the materials conform to.
    - 1.1.4. Special features, if any, as called for in the specific requirement
    - 1.1.5. Type of oil/Grease wherever required and its annual consumption.
  - 1.2. Relevant catalogue/leaflet of the actuators
  - 1.3. Quality Plan duly signed & stamped with bidder's seal.
2. The following shall be submitted within the stipulated time period as per vendor's drawings/ documents schedule, but not later than one month before first dispatch.
  - 2.1. Drawings of components & details as deemed necessary.
  - 2.2. Instruction manual for erection, operation and maintenance.
  - 2.3. Storage instructions.
3. Before dispatch of the equipment the vendor shall furnish the following.
  - 3.1. Material Test certificates.
  - 3.2. Shop test reports and certificates.
4. Distribution of drawings / documents for all projects:
  - 4.1. After award of the contract the successful bidder shall furnish drawings/ documents as per following distribution schedule.

Sl. No.	Type of Document	No of Hard copies	No. of Soft copies
1	Documents submitted for Approval	2 Nos.	2 Nos.
2	Final Distribution(Approved Documents)	5 Nos.	3 Nos.
3	O&M Manuals	8 Nos.	3 Nos.

2X660MW OPGC BANHARPALLI TPS

VOLUME – III

TECHNICAL SCHEDULES


FOR

SPRING LOADED BYPASS VALVES

SPECIFICATION NO. PE-TS-391-100-M009




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

	TITLE:	SPECIFICATION NO. PE-TS-391-100-M009	
	SPRING LOADED BYPASS VALVES	VOLUME : III	
	2X660MW OPGC BANHARPALLI TPS	SECTION :	
		REV. NO. : 00	DATE: 02.07.2014
		SHEET 1 of 6	

### CONTENTS

SL.NO	TITLE
1.	COMPLIANCE SHEET
2.	SCHEDULE OF DEVIATIONS
3.	SCHEDULE OF DECLARATIONS
4.	SCHEDULE OF PRICES

	TITLE:	SPECIFICATION NO. PE-TS-391-100-M009	
	COMPLIANCE SHEET	VOLUME : III	
	SPRING LOADED BYPASS VALVES	SECTION :	
	2X660MW OPGC BANHARPALLI TPS	REV. NO. : 00	DATE: 02.07.2014
		SHEET 1 of 2	

The bidder shall sign and return a copy of this compliance sheet along with his offer, indicating his compliance to the points specified herein:

A) **Technical Details:** Bidder to tick whichever is applicable.

1.	Technical requirements as per Data sheet-A & Standard Technical Specification of Vol. IIB Section-D	Accepted	Not Accepted
2.	Quality Plan	Accepted	Not Accepted
3.	Specific Technical requirements of Vol. IIB Section-C	Accepted	Not Accepted
4.	Documentation requirement as per Data sheet-C of Vol. IIB Section-D	Accepted	Not Accepted

B) Deviations to the technical specification are not acceptable. However, if there are any deviations due to unavoidable reasons then the same to be clearly specified in the schedule of deviation. In case of no deviations, schedule of deviations to be filled as NIL by bidder.

C) The offered materials should be either equivalent or superior to those specified. Also for components where material is not specified, the material used shall be suitable for intended duty.

D) QP/ test procedures shall be submitted in the event of order based on the guidelines given in the specification & QP enclosed therein. QP will be subject to BHEL/Customer approval in the event of order & customer hold points for inspection/ testing shall be marked in the QP at the contract stage. All Inspection/ testing shall be as per approved QP. The charges for 3rd party inspection (Lloyds, TUV or equivalent) for foreign bidders shall be included in the base price of the equipment by the bidder. This 3rd party inspection agency shall be approved by BHEL and will be decided in contract stage.


E) All drawings/data – sheets etc. to be submitted during contract shall be subject to BHEL/Customer review/ approval.

F) GA drawings, as submitted with offer at tender stage are for reference purpose only and shall be subject to approval during contract stage.

G) The commissioning spares (if any) are supplied on 'As Required Basis' & prices for same shall be quoted in the price bid format. If the bidder has not quoted for commissioning spares at tender stage and if the same are actually required during commissioning, then the same shall be supplied by bidder without any cost to BHEL.


H) All drawings/documents in soft as well as hard copy shall be submitted within 2 weeks from placement of Purchase orders in the event of order. A technical representative of bidder shall come for meeting with BHEL along with revised documents within one week of receipt of BHEL comments to resolve all issues and incorporate all comments in the soft copy for further submission to customer if required. Further, on receipt of customer comments on the documents a technical representative from bidder shall come for meeting to resolve all issues and incorporate all comments in the soft copy at BHEL and resubmit the drawings /documents for CAT I approval and shall visit customer/customer's consultant if required for across the table approval of documents.

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL

	TITLE:	SPECIFICATION NO. PE-TS-391-100-M009	
	COMPLIANCE SHEET	VOLUME : III	
	SPRING LOADED BYPASS VALVES	SECTION :	
	2X660MW OPGC BANHARPALLI TPS	REV. NO. : 00	DATE: 02.07.2014
		SHEET 2 of 2	

- I) Any special tools & tackles, if required, shall be in bidder's scope.
- J) Prices for recommended spares (if any) for three year operation shall be furnished separately and not to be included in the base price.
- K) The offered model design should be of bidder's proven model and they should have designed, manufactured, supplied and tested the equipment of similar type and rating in at least Two (2) projects and be in satisfactory operation for last two (2) years.

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL

	<b>TITLE</b> * SCHEDULE OF DEVIATIONS ( ) From Technical Specifications (Volume -II B)	SPECIFICATION NO PE-TS-391-100-M009
		VOL III
		SHEET..... OF.....

We the undersigned hereby certify that the above mentioned are the only deviations.

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				COMPANY SEAL
NAME	DESIGNATION	SIGNATURE	DATE	

	<b>TITLE</b> <b>*SCHEDULE OF DECLARATIONS</b>	SPECIFICATION NO PE-TS-391-100-M009
		VOL III
		SHEET..... OF.....

\* Bidder shall include this schedule both in technical and Price offers

**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 format proposal number Dated ..... and there is no deviation to the specification other than those listed in "Schedule of deviations" of this Vol. III.

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


Bidder's Company Name .....

Authorised representative's Signature .....

Name .....

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

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL

	TITLE:	SPECIFICATION NO. PE-TS-391-100-M009	
	PRICE FORMAT	VOLUME :	
	SPRING LOADED BYPASS VALVES	SECTION :	
	2X660MW OPGC BANHARPALLI TPS	REV. NO. : 00	DATE: 02.07.2014
		SHEET 1 of 1	

### 1. PRICE SCHEDULE (MAIN VALVES WITHOUT COMMISSIONING SPARES)

SL.NO	SPRING LOADED BYPASS VALVE	MAIN VALVE(NOS.)	UNIT PRICE (FOB)	TOTAL PRICE (FOB)
1.	FDV-35	2		
2	FDV-36	2		

### 2. PRICE SCHEDULE (COMMISSIONING SPARES)

SL.NO	SPRING LOADED BYPASS VALVE	BONNET GASKET (NOS)	CAP GASKET (NOS)	UNIT PRICE (FOB)	TOTAL PRICE (FOB)
1	FDV-35	2	2		
2.	FDV-36	2	2		

### 3. PRICE SCHEDULE (MANDATORY SPARES WITHOUT COMMISSIONING SPARES)

SL.NO	SPRING LOADED BYPASS VALVE	MANDATORY VALVE(NOS.)	UNIT PRICE (FOB)	TOTAL PRICE (FOB)
1	FDV-35	1		
2.	FDV-36			

### 4. PRICE SCHEDULE (RECOMMENDED SPARES)

SL.NO	SPRING LOADED BYPASS VALVE	RECOMMENDED SPARES (TO BE FILLED BY BIDDER)	UNIT PRICE (FOB)	TOTAL PRICE (FOB)
1	FDV-35			
2.	FDV-36			

#### NOTES:

- Main valve prices shall BE EXCLUSIVE of cost of Commissioning Spares prices.
- Bidder is required to quote unit price of each item under commissioning spares separately & individually i.e. prices of all commissioning spares shall not be clubbed/ included in the unit prices of Main valves.
- Bidder to note that the Mandatory spares valves are only complete valve assembly and are required without any commissioning spares. Hence unit price of Mandatory spare valve shall NOT BE INCLUSIVE of prices of commissioning spares and therefore, shall be quoted separately. Bidder to note that there shall be separate Purchase order for Mandatory Spares and these spares shall also supplied duly packed in separate packing boxes.