



BHARAT HEAVY ELECTRICALS LIMITED
PROJECT ENGINEERING MANAGEMENT

PROJECT : 2X660 MW ENNORE SEZ STPP
PACKAGE : AUX PRDS

DATE: - 26.04.2017

Corrigenda/Addenda-2

Reference: i) Enquiry No. E-5522/2016 Dtd. 20.03.2017
ii) Corrigenda/Addenda-1 Dtd. 18.04.2017

Due Date : 02/05/2017 (02:00 PM)

Subject: QAP revision and due date extension for offer submission

QAP for subject package & project has been revised. Revised QAP is attached herewith. Bidders to note the same and quote accordingly.

Bid submission date against Tender Enquiry PE/PG/EN1/E-5522/2016 Dated 20.03.2017 is extended till **02.05.2017 (02.00 PM)**. The Techno-Commercial Bids shall be opened on same day at **03.00 PM**.

The bidders, who already have already submitted their offer may opt to submit revised bid on account of QAP revision on or before revised due date & time of offer submission otherwise revised QAP shall be considered as accepted without need of change in already submitted offer.

All other terms and conditions shall remain unchanged.

Regards

Anil Kumar Pandey

Dy. Manager

PG-II-2

QUALITY PLAN FOR CONTROL VALVE (PNEUMATIC)

JOB NO. 412					PROJECT- 2 X 660 MW ENNORE SEZ SUPERCRITICAL THERMAL POWER PROJECT AT ASH DYKE OF NCTPS, CHENNAI												
STATUS CONTRACT							OWNER		TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED								
PRINT SCALE 									OWNER'S CONSULTANT		DESEIN PRIVATE LIMITED DESEIN HOUSE, NEW DELHI						
REV. 02	DATED. 01.07.15	ALTD RV	CHD CM	APPD SCS					EPC CONTRACTOR		BHARAT HEAVY ELECTRICALS LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA				DEPT CODE		NAME
1. REVISED AS PER CUSTOMER COMMENTS DTD. 27.06.2015							I										
REV. 01	DATED. 29.05.15	ALTD ---Sd--- RV	CHD ---Sd--- CM	APPD ---Sd--- SCS									DSGN	RV	---Sd---	13.03.15	
1. REVISED AS PER CUSTOMER COMMENTS DTD. 22.05.2015													CHD	CM	---Sd---	13.03.15	
													APPD	SCS	---Sd---	13.03.15	
					TITLE QUALITY PLAN FOR CONTROL VALVE (PNEUMATIC)												
															DRAWING NO. PE-QP-412-145-I006		
															SHEET 1 OF 8		
															REV 02		



QUALITY PLAN NO.: PE-OP-412-145-I 006

SECTION

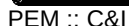
DATE: 01.07.15

8

1.0	MATERIAL													
1.1	Body & Bonnet casting / forgings, plug, valve stem, seat ring/cage.	1.	Physical, Chemical properties	MA	Physical, Chemical tests	One/ Heat (HT Batch)	Approved drg. / data sheet / BHEL specn.	Approved drg. / data sheet / BHEL specn.	Test Certificate	3	---	2,1, 4		
		2.	Heat Treatment	MA	Review of H.T. Chart	Each H.T.	Approved drg. / data sheet / BHEL specn.	Approved drg. / data sheet / BHEL specn.	Test Certificate	3/2	2	1,4	IBR Certification (if applicable) to be verified by BHEL	
		3.	Internal quality of castings	MA	RT for Body & UT for Bonnet(NDT)	100%	ASME B 16.34	ASME B 16.34	Test Report / FILM	3/2	2	1,4	Only for rating ANSI 900 and above. Applicable for Body and Bonnet only. For Lower rating only if called for in specification.	
		4.	Surface Quality	MA	1.	Visual	100%	MSS-SP-55	MSS-SP-55	Test Certificate	3/2	---	2,1, 4	
					2.	MT/PT	100%	ASME B 16.34	ASME B 16.34	Test Certificate	3	2	1,4	After Machining on machined surface only

1 - BHEL
2 - Vendor
3 - Sub-ver

4 - TANGEDCO



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SHEET

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OF

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Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^s			Remarks
									P	W	V	
		5. Pressure test for shell	MA	Hyd. Test	100%	ISA-S-75.19/ ASME B 16.34	ISA-S-75.19/ ASME B 16.34	Test Certificate	2	2	1,4	For Body & Bonnet after machining
1.2	Diaphragm	1. Surface Quality	MA	Visual	100%	Mfr. standard	Mfr. standard	Test Certificate	3/2	---	2,1,4	
		2. Hardness	MA	Measurement	100%	Mfr. standard	Mfr. standard	Test Certificate	3/2	---	2,1,4	
		3. Endurance / Life cycle	MA	Cyclic test 10,000 cycles	One / Type	10,000 cycles/ Mfr. standard.	No damage	Test Certificate	3/2		2,1,4	
1.3	Spring	1. Composition	MA	Chemical-Analysis	One sample/ Heat	Material spec. / Mfr. standard	Material spec. / Mfr. standard	Test Certificate	3	---	2,1,4	
		2. Mech. Properties	MA	Mech. Test	One sample/ Heat	Material spec. / Mfr. standard	Material spec. / Mfr. standard	Test Certificate	3	---	2,1,4	
		3. Performance	MA	1. Stiffness ratio	100%	Material spec. / Mfr. standard	Material spec. / Mfr. standard	Test Certificate	3	---	2,1,4	
				2. Scragging	100%	Material spec. / Mfr. standard	Material spec. / Mfr. standard	Test Certificate	3	---	2,1,4	
				3. Cyclic test (Endurance)	One / type	10,000 cycles	Material spec. / Mfr. standard	Test Certificate	3	---	2,1,4	
				4. Dimension (Measurement)	One sample/ Lot	Mfr. Standard/ Approved drg. / data sheet	Appd Drg	Record	3	---	2,1,4	
		1.4	Electrical items [Limit switches, Solenoids, Position Transmitter(if provided externally)]	1. Routine Test	MA	HV, IR, Continuity function	100%	Rele. Standards	Rele. Standards	Test Certificate	3	---

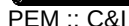
LEGEND: * CR - Critical characteristics
MA - Major characteristics
MI - Minor characteristics

RT- Radiographic Test PT – Dye penetrant Test
UT – Ultrasonic Test MT- Magnetic Test
NDT- Non Destructive Test

\$ P - Agency Performing the Test.
W - Agency Witnessing the Test.
V - Agency Verifying the Test.

1 - BHEL
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3 - Sub-vendor

4 - TANGEDCO



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Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^s			Remarks
									P	W	V	
		2. Degree of protection	MA	IP/NEMA Tests	One sample / type	Approved Data sheet	Approved Data sheet	Test Certificate	3	---	2,1,4	
1.5	Pressure Gauges	1. Performance	MA	Review of calibration certificates	100%	Mfr. Standard/ Approved drg. / data sheet	Mfr. Standard/ Approved drg. / data sheet	Test Certificate	3	---	2,1,4	
		2. Marking	MA	Visual	100%	Mfr. Standard/ Approved drg. / data sheet	Mfr. Standard/ Approved drg. / data sheet	Records	3	---	2,1,4	
2.0	IN PROCESS INSPECTION											
2.1	After machining, i, Body ii Bonnet iii Plug iv Valve Stem v seat ring/cage	1. Surface flaws	MA	Visual & MT/PT	100% (on accessible surfaces)	ASME B 16.34	ASME B 16.34	Test Records	2	---	1,4	Butt weld ends shall be included.
		2. Dimensional checks	MA	Measurement	100%	Mfr. Standard/ Approved drg. / data sheet	Mfr. Standard/ Approved drg. / data sheet	Records	2	---	1,4	
		3. Hard facing (wherever applicable)	MA	Hardness Measurement	One sample/Lot	Mfr. Standard/ Approved drg. / data sheet	Mfr. Standard/ Approved drg. / data sheet	Records	2	---	1,4	
2.2	Lapping	Machining surface contact	MA	Blue Matching	One sample/lot	-----	Proper Physical Contact	---	2	---	---	
3.0	TESTS ON COMPLETED VALVE											
3.1	Actuator Chamber	Leakage & Strength	MA	Pneumatic test	100%	Mfr. Standard/ Approved drg. / data sheet	No Leakage	Test Certificate	2	1,4	1,4	Refer Note-4

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 PEM :: C&I		QUALITY PLAN FOR CONTROL VALVE (PNEUMATIC)						QUALITY PLAN NO.: PE-QP-412-145-I 006				
								VOLUME				
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Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^{\$}			Remarks
									P	W	V	
3.2	Body	Leakage and Pressure test (Body Mount Leakage)	MA	Hydro test	100%	ISA - S-75.19/ ANSI B 16.34	No Leakage	Test Certificate	2	1,4	1,4	Refer Note-4
3.3	Seat leakage test for completed valve	Seat Leakage	MA	Pneumatic Test	100%	FCI-70.2	FCI-70.2	Test Certificate	2	1,4	1,4	Refer Note-4
4.0	OPERATION TEST ON COMPLETED VALVE (Final inspection)	1. Valve Travel	MA	Measurement	100%	Approved drg. / data sheet	Approved drg. / data sheet	Test Report	2	1,4	1,4	Refer Note-4
		2. Opening/Closing time	MA	Measurement	100%	Approved drg. / data sheet	Approved drg. / data sheet	Test Report	2	1,4	1,4	Refer Note-4
		3. Linearity/cam characteristic	MA	Measurement	100%	Approved drg. / data sheet	Approved drg. / data sheet	Test Report	2	1,4	1,4	Refer Note-4
		4. Repeatability	MA	Measurement	100%	Approved drg. / data sheet	Approved drg. / data sheet	Test Report	2	1,4	1,4	Refer Note-4
		5. Hysteresis	MA	Measurement	100%	Approved drg. / data sheet	Approved drg. / data sheet	Test Report	2	1,4	1,4	Refer Note-4
		6. Sensitivity	MA	Measurement	100%	Approved drg. / data sheet	Approved drg. / data sheet	Test Report	2	1,4	1,4	Refer Note-4
		7. Accuracy (Overall)	MA	Measurement	100%	Approved drg. / data sheet	Approved drg. / data sheet	Test Report	2	1,4	1,4	Refer Note-4
		8. Control Valve characteristics / CV Test	MA	♦ Measurement (Press. vs. discharge and discharge vs. opening 0-100% in steps of 10%)	One per type	As per specs/ Approved drg. / data sheet	As per specs/ Approved drg. / data sheet	Test Certificate	2	4	1,4	♦ Size = Body & port size Or Body size & CV for non std port. Refer Note 1.
		9. FL factor	MA	Measurement	One per type	As per specs/ Approved drg. / data sheet	As per specs/ Approved drg. / data sheet	Test Certificate	2	4	1,4	

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4 - TANGEDCO

 PEM :: C&I		QUALITY PLAN FOR CONTROL VALVE (PNEUMATIC)						QUALITY PLAN NO.: PE-QP-412-145-I 006				
								VOLUME				
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Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^{\$}			Remarks
									P	W	V	
		10. Operation of limit switch & solenoids and other accessories	MA	Function	100%	Approved drg. / data sheet	As per specs/ Approved drg. / data sheet	Test Report	2	1,4	1,4	On assembled valve Refer Note-4
		11. Overall dimensions	MI	Visual and dimensional	100%	Approved drg. / data sheet	As per specs/ Approved drg. / data sheet	Records	2	1,4	1,4	Refer Note-4
		12. Pre defined valve position in case of air failure	MA	Visual	100%	As per spec & Appd drg	As per spec & Appd drg	Test Certificate	2	1,4	1,4	
		13. Cleanliness, painting, stamping (for direction of flow), Tag No.	MA	Visual and dimensional	100%	Approved drg. / data sheet	As per specs/ Approved drg. / data sheet	Test Certificate	2	1,4	1,4	
5.0	AUXILIARY ITEMS (Performance test of auxiliary items shall be performed on the completely assembled valve)											
5.1	Positioner	Overall leakage after assembly including Nozzles leakage	MA	Leak Test (in the steady state input signal)	100 %	Mfr. Standard/ Approved drg. / data sheet	No leakage	Test Certificate	3/2	---	1,4	Overall leakage including tubing
5.2	Air filter regulator	1. Normal air consumption	MA	Measurement	Each type	Mfr. Standard/ Approved drg. / data sheet	No leakage	Test Certificate	3/2	---	1,4	
		2. Overall leakage	MA	Visual (soap solution)	100 %	Mfr. Standard/ Approved drg. / data sheet	No leakage	Test Certificate	3/2	---	1,4	
5.3	Air lock relay	Performance Test	MA	Leakage test	100%	Mfr. Standard/ Approved drg. / data sheet	No leakage	Test Certificate	3/2	---	1,4	

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Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^s			Remarks
									P	W	V	
5.4	Electronic position transmitter(not applicable if provided integral to smart positioner)	1. Accuracy	MA	Operation	100%	Approved data sheet	Approved data sheet	Test Certificate	2	1,4	1,4	
5.5	Current to Pneumatic converter(not applicable for smart positioner)	1. Physical Verification Make/Model	MA	Visual	100%	Approved drg. / data sheet	Approved drg. / data sheet	Test Certificate	2	---	2,1,4	
		2. Degree of Protection	MA	IP/NEMA test	Each type	Relevant Standard	Relevant Standard	Test Certificate	3	---	2,1,4	
		3. Linearity	CR	Measurement	100%	Approved drg. / data sheet / BHEL specn.	Approved drg. / data sheet / BHEL specn.	Inspection Report	2	---	1,4	
		4. Hysterisis	CR	Measurement	100%	Approved drg. / data sheet / BHEL specn.	Approved drg. / data sheet / BHEL specn.	Inspection Report	2	---	1,4	
5.6	Smart Positioner (As Applicable)	1. Physical Verification Make/Model	MA	Visual	100%	Approved drg. / data sheet	Approved drg. / data sheet	Test Certificate	2	---	2,1,4	
		2. Degree of Protection	MA	IP/NEMA test	Each type	Relevant Standard	Relevant Standard	Test Certificate	3	---	2,1,4	
		3. Linearity	CR	Measurement	100%	Approved drg. / data sheet / BHEL specn.	Approved drg. / data sheet / BHEL specn.	Inspection Report	2	---	1,4	
		4. Hysterisis	CR	Measurement	100%	Approved drg. / data sheet / BHEL specn.	Approved drg. / data sheet / BHEL specn.	Inspection Report	2	---	1,4	
		5. Calibration with Hand Held Communicator	MA	Measurement	Each type	Approved data sheet / Mfr. Standard	Approved data sheet / Mfr. Standard	Test Certificate	2	1,4	1,4	

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									VOLUME			
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Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^{\$}			Remarks
									P	W	V	
6.0	PAINTING	Soundness of Painting	MA	Visual and Measurement	100%	BHEL specn. / Mfr. Standard	BHEL specn. / Mfr. Standard	Inspection Report	2	---	---	Refer Note-2
7.0	PACKING	Soundness of Packing against transit damage	MA	Visual	100%	Mfr. Standard/ Approved drg. / data sheet	Mfr. Standard/ Approved drg. / data sheet	Inspection Report	2	---	---	Refer Note-3

NOTES:

- CV test shall be conducted at FCRI/Any govt. approved laboratory/ BHEL approved Laboratory for each type & size of control valve.
- In the absence of BHEL spec. for painting, vendor to obtain BHEL's approval on their painting specification / procedure.
- Sea worthy packing shall be provided, if applicable.
- The quantum of check shall be 100% for manufacturer and 10% for BHEL/BHEL nominated inspection agency.
- IBR certificates in Form III-C shall be submitted if called for in the specification/datasheet.
- Copies of all TC's (Test Certificates) for materials duly correlated with Heat Nos., TC's for electrical items and mechanical tests(Leak/Operation) shall be submitted to BHEL & TANGEDCO for verification and acceptance.
- Test certificates for following accessories to be provided to BHEL & TANGEDCO for verification:

S.No.	Accessories	Type of test
1	Air Filter Regulator	Calibration Test
		Accuracy Test
2.	Solenoid Valves	Hydro Test
		Seat Leakage Test
		Coil Insulation Test
3.	Junction Box	IP Class

- The fully assembled or completed valves including the operators control devices and accessories shall be functionally tested to demonstrate the operationability of the valve and the operation. This may be done by cycling the valves 3 or 4 times from open to close position.

LEGEND: *	CR - Critical characteristics	RT- Radiographic Test	PT – Dye penetrant Test	\$ P - Agency Performing the Test.	1 - BHEL	4 - TANGEDCO
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	MI - Minor characteristics	NDT- Non Destructive Test		V - Agency Verifying the Test.	3 - Sub-vendor	