Index
For tender documents (Technical)
Tender no B/4011/2015/5710V1

Digitally signed by Diwakar Vikram Singh
DN: cn=Diwakar Vikram Singh, o=Bharat Heavy ELectricals Limited, ou=HEEP - Haridwar, email=diwakar@bhelhwr.co.in, c=IN
Date: 2016.06.03 08:19:02 +05'30'

TABLE-1: VALVE DATA:-

OPERATING PARAMETERS	OPERATING CONDITION		
	CASE-1	CASE-2	CASE-3
INLET PRESSURE bar(a)	1.048		
INLET TEMPERATURE	517.7	503.6	509.6
FLOW RATE (Kg/sec.)	1.62	1.876	3.056
OUTLET PRESSURE bar(a)	0.4		
FLUID	STEAM		
DESIGN PRESSURE bar(a)	16 bar		
DESIGN TEMPERATURE (°C)	590		

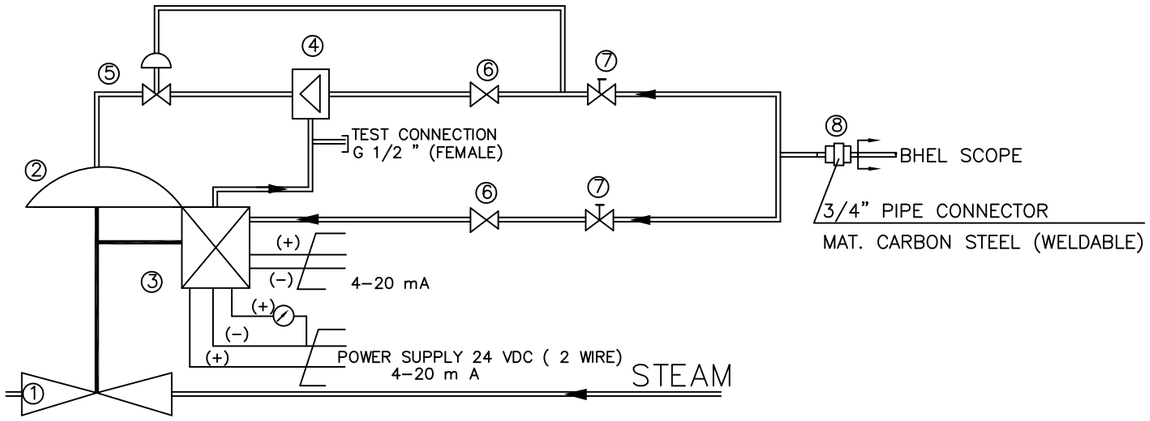


FIG.1: SCHEMATIC DIAGRAM FOR LEAKAGE STEAM CONTROL VALVE

TABLE-2: ACTUATOR DATA:-

TYPE	ELECTRO-PNEUMATIC
INPUT SIGNAL	4 TO 20 mA.
OPERATING TIME FOR FULL CONTROL STROKE	3 sec.
△P ACTUATOR	2 bar
TYPE OF DRIVE	DIAPHRAGM
FAILURE MODE	STAYPUT
PRESSURE OF CONTROL AIR SUPPLY AHEAD OF ACTUATOR (MAX/MIN.)	10/5 bar(g)
PNEUMATIC CONNECTION	3/4" WELDABLE
POSITIONER	I/P - POSITIONER (SMART TYPE)
ELECTRONIC POSITION FEEDBACK TRANSMITTER FOR BHEL USE	2 WIRE TYPE 4~20 mA OUTPUT, 24 V DC

TABLE-4:

ITEM DESCRIPTION
1. CONTROL VALVE FUNCTION: AIR TO OPEN SPRING TO CLOSE.
2. PNEUMATIC ACTUATOR: SPRING-DIAPHRAGM TYPE
3. I/P-POSITIONER
4. AIR VOLUME BOOSTER
5. BLOCKING VALVE
6. FILTER AND REDUCING STATION
7. STOP VALVE
8. 3/4" PIPE CONNECTOR

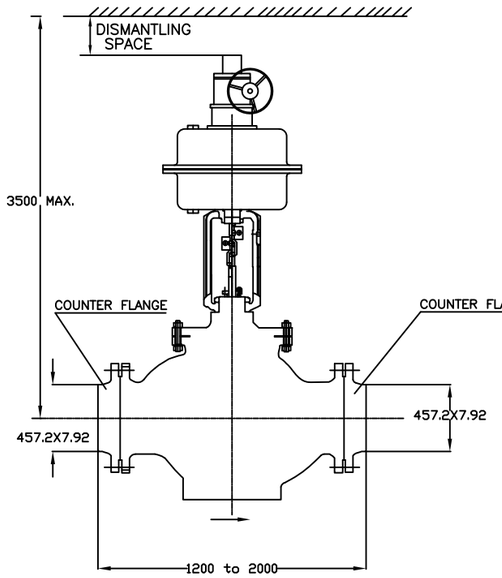


FIG.2: PROPOSED ARRANGEMENT OF LEAKEGE STEAM CONTROL VALVE (REFER SH.2, T.R. 1.3)

TABLE-3: END CONNECTION DETAIL(i.e. COUNTER FLANGES, REFER SH.2, T.R. 1.3):-

END CONNECTION	NOMINAL DIA.	SIZE		TYPE OF CONNECTION	WELD FIG./ FORM
		OUTER DIA.(mm)	WALL THICKNESS(mm)		
INLET	18"	457.2	7.92	BUTT WELDED	FIG.4 AS PER ASME B16.25
OUTLET	18"	457.2	7.92	BUTT WELDED	FIG.4 AS PER ASME B16.25

MAT. CODE : W90313240361

NOTE:

FOR TECHNICAL REQUIREMENTS REFER SHEET-2.

GRADE OF UNTOL.DIM
M/CG.-C/M/F AA0230208
WELDING-A/B/C/D AA0621104
GAS CUTTING-'T3'AA0621101

GMS No./ CBOM No.			STATUS OF DRG
AGREED DEPT	NAME	SIGN	DATE
CIE	SASWATI	-SD-	18.11.14

REV	DATE	ALTERED / CHECKED

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STEAM TURBINE

BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR

	NAME	SIGN	DATE
DRN	UVERMA	- sd -	18.11.14
CHD	AKS/NN	- sd -	18.11.14
APPD	N.GARG	- sd -	18.11.14

NO. OF VAR -

DEPT STE, CODE 4011 | SCALE NTS | WEIGHT (KG) - | REF. TO ASSY. DRG. - | ITEM No. - | NO. OF ITEMS -

TITLE: LEAK STEAM CONTROL VALVE WITH PNEU. ACT.

CARD CODE

DRAWING NO. 2-13240-39000 -

SHEET No. 01 | No. OF SHEETS 02

SIZE A2

A-000565-984511/007 REV.A
DPPPG-7006407; Ref.Drawing No.: 2-13240-58000

Sign & Date

Inventory No

A-000565-984514/007 REV.A
DPPPG-70064047; 2-13240-58000
Ref.Drawing No)

Sign & Date

Inventory No

TECHNICAL REQUIREMENTS:

1. DESIGN AND MANUFACTURING REQUIREMENTS:

1.1 SUPPLIER TO OFFER THE VALVE & ACTUATOR SUITING TO THE INPUT PARAMETERS AS SPECIFIED IN THE TABLE-1 & 2. SUPPLIER TO KEEP ATLEAST 10% MARGIN OVER THE REQUIRED Cv WHILE SELECTING THE VALVE.

1.2 VALVE SHALL BE ABLE TO MANAGE THE MASS FLOWS FOR ALL CASES AS MENTIONED IN VALVE DATA TABLE-1.

1.3 VALVE SHALL BE FLANGED ENDED AT INLET/OUTLET AND COUNTER FLANGES (RAISED FACE & WELDING NECK TYPE CONFORMING TO ASME B16.5-2003) OF MATERIAL GRADE ASTM A182 Gr. F91 SHALL BE SUPPLED BY THE VENDOR ALONG WITH ASSOCIATED FASTENERS AND SEALINGS. END CONNECTIONS OF COUNTER FLANGES SHALL BE PROVIDED AS PER TABLE-3 TO MATCH WITH THE PIPES IN BHEL SCOPE. EXPANDER/REDUCER, IF REQUIRED, SHALL BE PROVIDED BY THE SUPPLIER OF MATERIAL GRADE ASTM A182 Gr. F91. HORIZONTAL & VERTICAL DIMENSION LIMITS SHOWN IN THE PROPOSED ARRANGEMENT DRAWING OF VALVE SHALL BE COMPLIED BY THE VENDOR. WEIGHT OF THE COMPLETE ASSEMBLY OF VALVE INCLUDING ACTUATOR SHALL NOT EXCEED 2000 KG.

1.4 VALVE BODY MATERIAL SHALL CONFORM TO ASTM A217 Gr. C12A.

1.5 VALVE CHARACTERISTICS SHALL BE EQUAL PERCENTAGE.

1.6 VALVE LEAKAGE CLASS: CLASS IV AS PER ANSI FCI 70-2.

1.7 THE VALVE MUST BE DESIGNED KEEPING IN VIEW OF THE FOLLOWING DATA:
(i) AMBIENT TEMPERATURE: 4°C TO 50°C
(ii) ABSOLUTE HUMIDITY : <= 60g WATER/m3 DRY AIR.
(iii) MAX. ERTHQUAKE FACTORS HORIZONTAL : 0.3g (Safe operation)/0.4g (Limit of integrity)
(iv) MAX. EARTH QUAKE FACTORS VERTICAL : 0.2g (Safe operation)/0.25g (Limit of integrity)
(v) NOISE LEVEL AT 1M DISTANCE: <= 85 dB(A)

1.8 FUNCTION OF VALVE ACTUATOR SHALL BE 'AIR TO OPEN AND SPRING TO CLOSE'.

1.9 SMART TYPE POSITINER, AIR VOLUME BOOSTER, AIR LOCKING SYSTEM FOR STAYPUT ACTION, FILTERS, STOP VALVES, ASSOCIATED PIPES AND PIPE CONNECTORS SHALL BE SUPPLIED BY THE VENDOR ALONG WITH THE ACTUATOR.

1.10 ADDITIONAL SPECIFICATIONS OF SMART POSITIONER AS PER DOCUMENT NO. 4-18102-50001 SHALL BE COMPLIED BY THE VENDOR.

1.11 AN ELECTRO-PNEUMATIC CONTROLLER SIPART PS2 BY SIEMENS COMPANY OR ARCAPRO 827A BY ARCA COMPANY IS NOT ALLOWED TO BE INSTALLED.

1.12 MOUNTING POSITION OF THE VALVE SHALL BE HORIZONTAL WITH VERTICAL SPINDLE.

1.13 HANDWHEEL SHALL BE PROVIDED IN THE ACTUATOR FOR MANUAL OPERATION. PROVISION SHALL BE MADE BY THE VANDOR FOR MANUAL RELEASE OF AIR WHICH GETS TRAPPED IN THE ACTUATOR IN CASE VALVE IS ON 'STAYPUT' DURING AIR SUPPLY FAILURE.

1.14 THE FOLLOWING ITEMS SHALL BE INCLUDED IN THE OFFER AS COMMISSIONING SPARES:
(i) PACKING AND GASKETS: 1 SET
(ii) LOCK WASHER FOR FLANGE: 1 COMPLETE SET FOR EACH FLANGE CONNECTION.

1.15 GASKET MATERIAL MUST BE PROVDED FREE FROM HARMFUL POLLUTIONS LIKE ASBESTOS AND FERRITE AND SHOULD HAVE AN EXTRAORDINARY TEMPEATURE RESISTANCE.

1.16 THE VALVE SHALL BE IBR APPROVED.

2. TESTING REQUIREMENTS:

2.1 Cv TEST SHALL BE CARRIED OUT BY THE SUPPLIER FOR THE VALVE & TEST REPORT SHALL BE SUBMITTED FOR BHEL REVIEW. THE Cv TEST CAN BE CARRIED OUT PHYSICALLY ON THE VALVE OR THROUGH COMPUTER SIMULATION. IN CASE TEST REPORT IS ALREADY AVAILABLE WHICH IS NOT MORE THAN 5 YEARS OLD, THE SAME SHALL BE ACCEPTABLE. FURTHER, IN CASE THE OFFERED VALVE IS ALREADY IN SUCCESSFUL OPERATION USING THE SAME VALVE BODY, SEAT & TRIM COMBINATION AS OF THE OFFERED VALVE, THE VENDOR MAY FURNISH NAME OF PROJECT, DATA SHEET, CROSS-SECTIONAL DRAWING OF THAT VALVE FOR REVIEW IN LIEU OF THE CV TEST REPORT.

2.2 **FOLLOWING TESTS SHALL BE PERFORMED ON VALVE & TEST REPORTS SHALL BE SUBMITTED FOR BHEL REVIEW:-**
2.2.1 SHELL STRENGTH TEST AS PER TEST P10 OF EN12266 PART-1 (LATEST EDITION) OR EQUIVALENT TEST AS PER ANSI / ASME STANDARD.
2.2.2 SHELL TIGHTNESS TEST AS PER TEST P11 OF EN12266 PART-1 (LATEST EDITION) OR EQUIVALENT TEST AS PER ANSI / ASME STANDARD.
2.2.3 SEAT TIGHTNESS TEST AS PER EN60534-4 (LATEST EDITION) OR ANSI FCI 70-2 (LATEST EDITION). ACCEPTANCE CRITERIA LEAKAGE CLASS-IV.
2.2.4 VALVE SHALL BE FUNCTIONALLY TESTED TO CHECK IT'S DESIGN CHARACTERISTICS.

2.3 RT & UT SHALL BE PERFORMED ON VALVE COMPONENTS AS PER ASME B16.34.

3. DOCUMENTS TO BE SUBMITTED BY THE SUPPLIER:

3.1 DOCUMENTS TO BE SUBMITTED ALONGWITH THE OFFER:
(i) DATA SHEET OF VALVE & ACTUATOR.
(ii) SIZING CALCULATIONS OF VALVE & ACTUATOR.
(iii) CROSS-SECTIONAL DRAWING OF VALVE ALONGWITH BILL OF MATERIAL.
(iv) VALVE CHARACTERISTIC CURVES.
(v) GENERAL ARRANGEMENT DRAWING OF VALVE ALONG WITH ACTUATOR INDICATING OVERALL DIMENSIONS, REQUIRED MAINTENANCE SPACE, DETAILS OF WELD ENDS, OVERALL ASSEMBLY WEIGHT & DIRECTION OF FLOW.
(vi) HOOK-UP DIAGRAM ALONG WITH IT'S FUNCTIONAL WRITE-UP.
(vii) CATALOGUES AF ALL ACCESSORIES eg. POSITIONER, VOLUME BOOSTER, AIR LOCK RELAY, AIR FILTER & REGULATOR.
(viii) REQUIRED SUPPLY AIR PRESSURE, SPRING RANGE, TUBING/CONNECTION SIZE.
(ix) RECOMMENDED QUALITY & QUANTITY OF AIR.
(x) LIST OF COMMISSIONING SPARES.
(xi) PRICED LIST OF RECOMMENDED SPARES FOR FUTURE ORDERING.

3.2 DOCUMENTS TO BE SUBMITTED IN THE EVENT OF ORDERING:
(i) IN THE EVENT OF ORDERING THE FOLLOWING DOCUMENTS ARE REQUIRED TO BE SUBMITTED WITHIN 4 WEEKS OF PLACEMENT OF PURCHASE ORDER & GOT APPROVED BY BHEL BEFORE START OF ANY MANUFACTURING ACTION.
(a) VALVE & ACTUATOR DATASHEET.
(b) CROSS-SECTIONAL DRAWING OF VALVE ALONGWITH BILL OF MATERIAL.
(c) GENERAL ARRANGEMENT DRAWING OF VALVE ALONG WITH ACTUATOR INDICATING OVERALL DIMENSIONS, REQUIRED MAINTENANCE SPACE, DETAILS OF WELD ENDS, OVERALL ASSEMBLY WEIGHT & DIRECTION OF FLOW.
(d) HOOK-UP DIAGRAM OF VALVE WITH ACTUATOR, POSITIONER, FILTERS & GAUGES ETC.

(ii) 25 HARD COPIES OF O&M MANUAL SHALL BE SUPPLIED BY THE VENDOR. OUT OF THESE, 3 COPIES SHALL BE SENT TO SITE ALONGWITH THE EQUIPMENT & REMAINING 22 COPIES SHALL BE SENT TO BHEL, HARIDWAR WITHIN 12 WEEKS OF PLACEMENT OF P.O.

4. GENERAL REQUIREMENTS :-

4.1 GUARANTEE: GUARANTEE/WARRENTEE PERIOD SHALL BE 24 MONTHS FROM THE DATE OF SHIPMENT OR 18 MONTHS FROM THE DATE OF COMMISSIONING, WHICHEVER IS EARLIER. INCASE OF ANY FAILURE OR TROUBLE REPORTED FROM THE SITE, THE SUPPLIER WOULD DEPUTE THEIR REPRESENTATIVE IMMEDIATELY TO ATTEND THE PROBLEM AND REPLACE THE DEFECTIVE COMPONENT/PARTS IF REQUIRED.

4.2 PAINTING: THE PAINTING SURFACE SHALL BE PREPARED ACCORDING TO ISO 8503-1 Sa 2 1/2. WELDING END SHALL BE 80mm PAINT FREE. VALVE BODY IS TO BE PAINTED WITH ALUMINIUM PAINT AS PER IS:13183 Gr.1 WITH PAINT THICKNESS OF MINIMUM 70 MICRONS.

4.3 PACKING & DESPATCH:

(i) THE VALVE SHALL BE PACKED AND LOCKED IN SUCH A WAY, THAT IN GENERAL CASE ANY DAMAGE IS PROHIBITTED.
(ii) ALL OPENINGS SHALL BE PLUGGED.
(iii) AS FAR AS POSSIBLE NECESSARY ACCESSORY DEVICES FOR TRANSPORTATION PURPOSE SHALL BE ATTACHED TO THE VALVE AND/OR TO THE PACKING e.g. LIFTING EYES & LIFTING SIGNS.
(iv) BEARING AREAS SHALL BE MARKED IF NECESSARY.

4.4 THE SUPPLIER SHALL BEAR FULL RESPONSIBILITY FOR COMPLIANCE OF ALL THE PARTS & COMPONENTS SUPPLIED IN PURSUENT TO THIS SPECIFICATION WITH THE FULL SCOPE OF SAFETY REGULATIONS OF THE COUNTRY.

MAT. CODE : W90313240361

REV	DATE	ALTERED / CHECKED
A		
B		
C		
D		
E		
F		

GMS No./ CBOM No.			STATUS OF U DRG
AGREED DEPT	NAME	SIGN	DATE
CIE	SASWATI	-SD-	18.11.14

GRADE OF UNTOL.DIM
M/CG.-C/M/F AA0230208
WELDING-A/B/C/D AA0621104
GAS CUTTING-'T3'AA0621101

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STEAM TURBINE

BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR

	NAME	SIGN	DATE
DRN	UVERMA	- sd -	18.11.14
CHD	AKS/NN	- sd -	18.11.14
APPD	N.GARG	- sd -	18.11.14

NO. OF VAR 73 74

DEPT	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS
STE	N.T.S	-	-		75 77
CODE 4011					

TITLE: LEAK STEAM CONTROL VALVE WITH PNEU. ACT.

CARD CODE 7 22 23 24

DRAWING NO. 2-13240-39000

SHEET No. 02 | No. OF SHEETS 02

SIZE A2

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED / CHECKED	REV	DATE	ALTERED / CHECKED	~~GMS No.~~/ C.B.O.M.– NO.	STATUS OF DRG
							U

ZONE		ZONE		AGREED DEPT	NAME	SIGN	DATE

GRADE OF UNTOL.DIM	M/CG. – AA0230208 m	WELDING–CLASS 'B' OF AA0621104	GAS CUTTING–TABLE 3 OF AA0621101

SPARES APPLICALBE FOR LEAK STEAM VALVE WITH PNEUMATIC ACTUATOR

SL.NO.	DESCRIPTION	QUANTITY
01.	BONNET SEAL FOR LEAK STEAM CONTROL VALVE	1 Set

NOTES:–

1. ALL THE MANDATORY SPARES SPECIFIED ABOVE SHALL BE MANUFACTURED EXACTLY SAME AS AGAINST MAIN SUPPLY.
2. INTERCHANGEABILITY OF THE MENTIONED ITEMS ARE FOR REPLACEMENT WITH THEIR PARTS FOR WHICH SUPPLY IS TO BE MADE AGAINST MAIN OFFER.
3. ALL THE SPARES MUST BE PACKED IN SEALED TRANSPARENT PLASTIC BAGS AND CLEARLY MARKED OR LABELLED ON THE OUTSIDE OF THE PACKING WITH ITS DESCRIPTION & ASSEMBLY PART NUMBERS.
4. QUALITY CHECKS & TESTING NORMS/REQUIREMENTS AS PER AGREED QUALITY PLAN (QP) SHALL ALSO BE APPLICABLE FOR ALL THE SPARES AS LISTED.
5. ALL THE RELEVENT ASSEMBLY DRGS. SHALL BE FURNISHED BY THE VENDOR MARKING ALL THE OFFERED ITEMS.
6. OFFERED ITEMS SHALL BE CORRELATED WITH THE ITEMS MENTIONED IN THIS DRAWING & WITH RESPECTIVE BOM OF MAIN EQUIPMENT DRAWING.

– Ref.Drawing No>

Sign & Date

MAT. CODE: W99313240394

BHARAT HEAVY ELECTRICALS LTD.
RANIPUR, HARDWAR

	NAME	SIGN	DATE	NO. OF VAR
DRN	HARENDRA	–sd–	16.07.15	–
CHD	NN/AKS	–sd–	16.07.15	
APPD	NEELU GARG	–sd–	16.07.15	

Inventory No.

DEPT STE / CODE 4011	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS
	–	–	–	–	–

TITLE :
SPARES FOR LEAK OFF STEAM CONTROL VALVE

CARD CODE

DRAWING NO. 4–13240–58002 (7 22 23 24) –

SHEET No. 01 | No. OF SHEETS 01

A4 SIZE

ANNEXURE-B

Check –List for Leak off steam valve (Material code: W90313240361), Drawing. No. 21324039000, Rev. 00

SL No.	BHEL SPECIFICATION REQUIREMENT	Vendor's confirmation/ Remark
1	**Valve body material:** ASTM A217 Gr. C12A	
2	**Counter Flange material:** ASTM A182 Gr. F91	
3	**Valve Class:** 300.	
4	**Valve Characteristics:** Equal %	
5	**Valve End connection details:** i. Inlet : 457.2X7.92, Butt welded as per fig.4 of ASME B16.25 ii. Outlet : 457.2X7.92, Butt welded as per fig.4 of ASME B16.25	
6	**Hand wheel for manual operation shall be provided.**	
7	**Manual vent valve shall be provided.**	
8	**Following commissioning spares shall be provided:** **i.Packing & gaskets 1 set.** **ii. Lock washer for flange: 1 complete set for each flange connection.**	
9	**Valve shall be IBR approved.**	
10	**Testing of valve as per cl. no. 2.2 of BHEL specification.**	
11	**Paint as per cl. no. 4.2 of BHEL specification or equivalent**	
12	**End connection in actuator for air supply:** 3/4" pipe connector (CS, weldable) to be supplied by the vendor	
13	**Failure mode: stay put**	
14	**Cv test report submission after placement of P.O.**	
15	**Operating time < 3 sec**	
16	**Weight of complete assembly of valve along with actuator<2000 Kg**	
17	**Valve leakage class-IV as per ANSI FCI 70-2**	
18	**Function of Actuator:** Air to open spring to close	
19	**Type of drive of actuator: spring diaphragm**	
20	**Recommended quality and quantity of air**	
21	**Required supply air pressure, spring range**	
22	**Documents submission for BHEL approval within 4 weeks after placement of P.O. as per cl. no. 3.2 of BHEL specification.**	
23	**O & M Manual:** Submission of 25 Hard copies (3 copies along with equipment to the site & remaining 22 to BHEL, Hardwar within 12 weeks of placement of P.O.).	

ANNEXURE-C

Seal steam supply valve/ Leak off steam control valve - Check List for Documents/Information to be furnished along with the offer

SL. No.	Document/Information details	Enclosed with the offer	
		Yes	No
1	Data sheet of valve and actuator		
2	Sizing calculation of valve and actuator		
3	Cross sectional drawing of the vale		
4	Bill of material of valve and actuator		
5	Valve characteristic curves		
6	General arrangement drawing of valve along with actuator indicating: i. overall dimensions, ii. required maintenance space, iii. details of weld ends, iv. overall assembly weight v. direction of flow		
7	Hook up diagram along with its functional write up		
8	Detailed catalogue mentioning type of position transmitter position controller, volume booster, air lock relay, air filter and regulator		
9	Controllable range of Cv		
10	Priced list of recommended spare parts for future ordering		

PROJECT : 250 /500/660/700/800 MW PROJECT **Date:10.06.2014**
ITEM : GLAND & SEAL STEAM CONTROL VALVE
ADDENDUM TO DRAWING NO:
APPLICATION : STEAM TURBINE

ADDITIONAL SPECIFICATION :

1.0 **SCOPE:** This specification is intended to cover the requirements of Smart positioner for Pneumatic actuator of control valve.

2.0 **ELECTRICAL:**

2.1 Input signal shall be 4-20 mA from control system with Hart signal super-imposed.
2.2 Power supply: loop powered .
2.3 Valve position sensing to be provided, non contact type, 4-20 mA for control system.

3.0 ENVIRONEMENT:

3.1 Operating temp shall be 0 to 70 degree C.
3.2 Humidity: 0-95%
3.3 Protection class shall be IP-65 minimum.

4.0. SOFTWARE CONFIGURATION DIAGNOSTIC:

4.1 Windows 2000/NT based software. Software shall meet the requirement for configuration, diagnostics, calibration and testing of the actuator.

4.2 It shall have advanced diagnostic features like Travel Counter on line partial closure test, valve signature analysis, step response test, valve friction/jamming detection . Software package for advanced diagnostic features is not required.

4.3 Factory valve signature tests reports (PR vs valve travel and Travel vs IP signal shall be provided.

5.0 CONFIGURATION/OPERATING MODES:

5.1 Calibration: Remote calibration, auto & manual calibration shall be possible.

5.2 Operating range : Full range & split range signal range.

5.3 Valve action : Direct & reverse valve action.

5.4 Flow characterization possible to fit valve linear,, equal percentage.

6.0 FAIL SAFE

6.1 In case control signal 4 – 20 Ma DC fails, (Pneumatic supply in OK condition, the valve will move to the default Fail safe position (Fail Close --- for Leak as well as seal steam valves).
In case Pneumatic signal fails, control signal (4 – 20 ma DC) in OK condition, then Air inside the Actuator will be Locked by Air Lock Relay, thus Fail Lock condition will be achieved i.e Last Position hold prior to Failure of Air supply.

7.0 PERFORMANCE:

7.1 Characteristic deviation shall be <=0.5% of SPAN.

7.2 Ambient temp. effect shall be <=0.01% Deg. C or better.

8.0 ACCESSORIES:

8.1 In built operator panel display with push buttons for configuration and display on the positioner itself (password/hardware Lock).

8.2 Air filter regulator to be provided.

8.3 Press Gauge Block for supply & output pressure, filter regulator other accessories shall be provided as on required basis for making system complete.

8.4 Junction Box to be provided. Junction Box Specification -18 Ways, ½'' NPT 3 Nos. Cable entry. Weather Proof IP 65 Min.

8.5 Cable glands to be provided. Cable gland specification-Double Compression SS 304(Weather Proof IP 65)

8.6 Position transmitter whether integral part of positioner or not :- To be specified by vendor.

9.0 **DOCUMENTS TO BE PROVIDED:**

9.1 Datasheet including positioner model and make, Hook –up diagram to be complete input/output signals duly terminated onto JB.

Prepared:	Checked:	Approved:
(A K Gupta)Sd/- (CIE)	(Saswati) Sd./- (CIE)	(K.B. Batra) Sd./- (CIE)

DRAWING No. 3-13240-00001

TABLE-1 SPARES FOR LEAK OFF STEAM VALVE

S.NO.	ITEM DESCRIPTION	QTY.
01	COMPLETE SET OF INTERNALS (EXCEPT OUTER BODY& BONNET ALONG WITH ACTUATOR)	1 SET
02	GUIDE BUSHINGS	1 SET
03	PLUG AND STEM ASSEMBLY	1 SET
04	CAGE	1 NO
05	SET OF O RINGS	1 SET
06	SEALING RINGS	1 SET
07	SET OF GASKETS	1 SET
09	BONNET SEAL	1 SET
10	SET OF PACKING	1 SET
11	SEAT RING	1 NO
12	GLAND PACKING	1 SET
13	RETAINER RING	1 NO

TABLE-2 SPARES FOR LEAK OFF STEAM VALVE ACTUATOR

S.NO.	ITEM DESCRIPTION	QTY.
01	COMPLETE ACTUATOR ASSEMBLY ALONG WITH ACCESSORIES	1 SET
02	POSITIONER ALONG WITH POSITION TRANSMITTER	1 NO
03	ACTUATOR DIAPHRAGM	1 NO
04	ACTUATOR STEM	1 NO
05	SEALS/GASKETS	1 SET
06	O RINGS	1 SET
07	AIR LOCK RELAY	1 NO
08	VOLUME BOOSTER	1 NO
09	AIR FILTER & RELIEF VALVE	1 NO
10	AIR SET	1 NO
11	PILOT RELAY	1 NO

TECHNICAL REQUIREMENTS :-

1. INTERCHANGEABILITY OF THE MENTIONED ITEMS ARE FOR REPLACEMENT WITH THEIR PARTS FOR WHICH SUPPLY IS TO BE MADE AGAINST MAIN OFFER
2. ALL THE SPARES MUST BE PACKED IN SEALED TRANSPARENT PLASTIC BAGS AND CLEARLY MARKED OR LABELLED ON THE OUTSIDE OF THE PACKING WITH ITS DESCRIPTION & ASSEMBLY PART NUMBERS.
3. QUALITY CHECKS & TESTING NORMS/REQUIREMENTS AS PER AGREED QUALITY PLAN (QP) SHALL ALSO BE APPLICABLE FOR ALL THE SPARES AS LISTED.
4. ALL THE RELEVENT ASSEMBLY DRGS. SHALL BE FURNISHED BY THE VENDOR MARKING ALL THE OFFERED ITEMS.

21323913000 Ref.Drawing No.

Sign & Date

Inventory No.

REV	DATE	ALTERED / CHECKED
01	27.02.16	ALTERED H.SINGH –SD– / CHECKED ADRASH –SD–

CHANGES HAVE BEEN INCORPORATE AS PER C/A NO.–STE–16–F0058.

GRADE OF UNTOL. DIM

M/CG.– ~~AA0230208 m~~

WELDING–~~CLASS 'B' OF AA0621104~~

GAS CUTTING–~~TABLE 3 OF AA0621101~~

~~GMS No./~~ C B O M — STATUS OF U DRG

AGREED DEPT	NAME	SIGN	DATE
CIE	SASWATI	–SD–	03.01.16

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STEAM TURBINE

BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR

	NAME	SIGN	DATE
DRN	HARENDRA	SD/–	01.01.16
CHD	AKS/NN	SD/–	02.01.16
APPD	P.K.BANSAL	SD/–	03.01.16

NO. OF VAR – (73 74)

DEPT STE

CODE 4011

SCALE NTS

WEIGHT (KG) —

REF. TO ASSY. DRG.

ITEM No. —

NO. OF ITEMS — (75 77)

TITLE : (01) OPTIONAL SPARES – LEAK OFF STEAM VALVE

CARD CODE

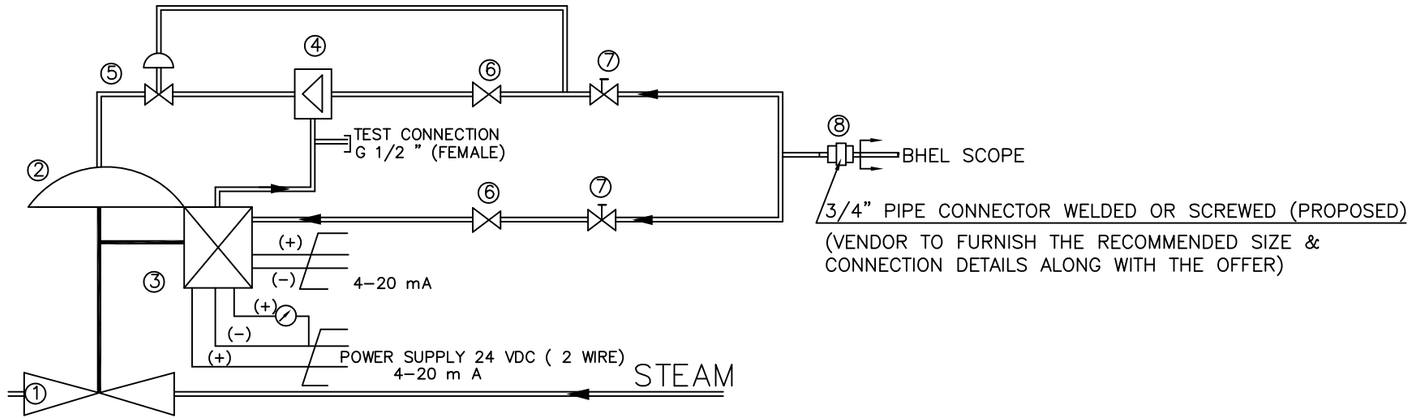
DRAWING NO. 7 3-13240-00001 22 — (23 24)

SHEET No. 1 | No. OF SHEETS 1

SIZE A3

TABLE–1: VALVE DATA:– (01)

OPERATING PARAMETERS	OPERATING CONDITION	
	CASE–1	CASE–2
INLET PRESSURE bar(a)	1.048	
INLET TEMPERATURE	331.5	415.7
FLOW RATE (Kg/sec.)	2.26	4.13
OUTLET PRESSURE bar(a)	0.4	
FLUID	STEAM	
DESIGN PRESSURE bar(a)	16 bar	
DESIGN TEMPERATURE (°C)	540	



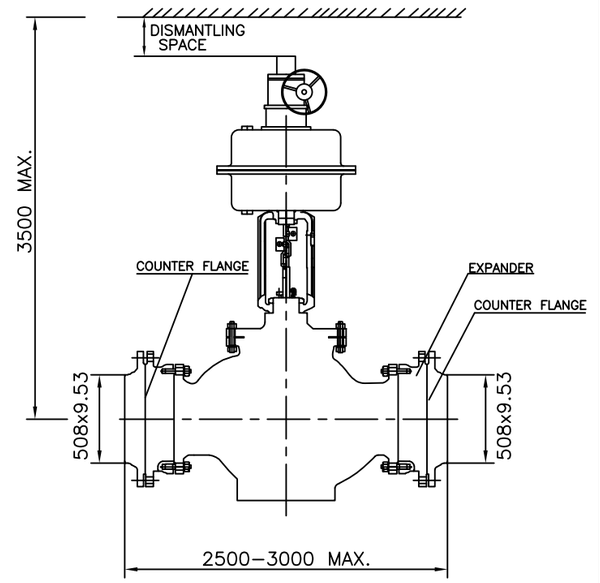
SCHEMATIC DIAGRAM FOR LEAKAGE STEAM CONTROL VALVE

TABLE–2: ACTUATOR DATA:–

TYPE	ELECTRO–PNEUMATIC
INPUT SIGNAL	4 TO 20 mA.
OPERATING TIME FOR FULL CONTROL STROKE	3 sec.
△P ACTUATOR	2 bar
TYPE OF DRIVE	DIAPHRAGM
FAILURE MODE	STAYPUT
PRESSURE OF CONTROL AIR SUPPLY AHEAD OF ACTUATOR (MAX/MIN.)	10/5 bar(g)
PNEUMATIC CONNECTION	SIZE 3/4" (PROPOSED)
POSITIONER	I/P – POSITIONER (SMART TYPE)
ELECTRONIC POSITION FEEDBACK TRANSMITTER FOR BHEL USE	2 WIRE TYPE 4~20 mA OUTPUT, 24 V DC

TABLE–4:

ITEM DESCRIPTION
1. CONTROL VALVE FUNCTION: AIR TO OPEN SPRING TO CLOSE.
2. PNEUMATIC ACTUATOR: SPRING–DIAPHRAGM TYPE
3. I/P–POSITIONER
4. AIR VOLUME BOOSTER
5. BLOCKING VALVE
6. FILTER AND REDUCING STATION
7. STOP VALVE
8. CONNECTOR



PROPOSED ARRANGEMENT OF LEAKEGE STEAM CONTROL VALVE (REFER SH.2, T.R. 1.3)

TABLE–3: END CONNECTION DETAIL(i.e. COUNTER FLANGES, REFER SH.2, T.R. 1.3):–

END CONNECTION	NOMINAL DIA.	SIZE		TYPE OF CONNECTION	WELD FIG./ FORM	NORM
		OUTER DIA.(mm)	WALL THICKNESS(mm)			
INLET	20"	508	9.53	BUTT WELDED	FIG.4	ASME B16.25
OUTLET	20"	508	9.53	BUTT WELDED	FIG.4	ASME B16.25

MAT. CODE : W90313240353

GRADE OF UNTOL.DIM
M/CG.–Ø/M/F AA0230208
WELDING–A/B/Ø/D AA0621104
GAS CUTTING–'T3'AA0621101

GMS No./ CBOM No. —

AGREED DEPT	NAME	SIGN	STATUS OF DRG / DATE
CIE	B.S.RANA	–sd–	16.11.12
PED	R.PANJA	–sd–	07.11.12

REV	DATE	ALTERED / CHECKED
01	01.05.13	ALTERED KJSS / CHECKED SHUBHAM
		CHANGES MADE AS PER C.A.NO. STE–13–F0183

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STEAM TURBINE

BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR

	NAME	SIGN	DATE
DRN	RAKESH	– sd –	05.11.12
CHD	S.MITTAL	– sd –	05.11.12
APPD	RCA	– sd –	05.11.12

NO. OF VAR –

DEPT STE | CODE 4011 | SCALE NTS | WEIGHT (KG) – | REF. TO ASSY. DRG. – | ITEM No. – | NO. OF ITEMS –

TITLE LEAK STEAM CONTROL VALVE WITH PNEU. ACT.

CARD CODE 7 22

DRAWING NO. 2–13240–51000 – 23 24

SHEET No. 01 | No. OF SHEETS 02

SIZE A2

12436–984131 Ref.Drawing No.

Sign & Date

Inventory No

TECHNICAL REQUIREMENTS:

1. DESIGN AND MANUFACTURING REQUIREMENTS:

1.1 SUPPLIER TO OFFER THE VALVE & ACTUATOR SUITING TO THE INPUT PARAMETERS AS SPECIFIED IN THE TABLE-1 & 2. SUPPLIER TO KEEP ATLEAST 10% MARGIN OVER THE REQUIRED Cv WHILE SELECTING THE VALVE.

1.2 VALVE SHALL BE ABLE TO MANAGE THE MASS FLOWS FOR ALL CASES AS MENTIONED IN VALVE DATA TABLE-1.

1.3 VALVE SHALL BE FLANGED ENDED AT INLET/OUTLET AND COUNTER FLANGES (RAISED FACE & WELDING NECK TYPE CONFORMING TO ASME B16.5-2003) OF MATERIAL GRADE SA182F22C3 SHALL BE SUPPLED BY THE VENDOR ALONG WITH ASSOCIATED FASTENERS AND SEALINGS. END CONNECTIONS OF COUNTER FLANGES SHALL BE PROVIDED AS PER TABLE-3 TO MATCH WITH THE PIPES IN BHEL SCOPE. EXPENDER / REDUCER, IF REQUIRED, SHALL BE PROVIDED BY THE VENDOR OF MATERIAL GRADE SA182F22C3. HORIZONTAL & VERTICAL DIMENSION LIMITS SHOWN IN THE PROPOSED ARRANGEMENT DRAWING OF VALVE SHALL BE COMPLIED BY THE VENDOR. WEIGHT OF THE COMPLETE ASSEMBLY OF VALVE INCLUDING ACTUATOR SHALL NOT EXCEED 2500 KG.

1.4 VALVE BODY MATERIAL SHALL CONFORM TO ASTM A217 Gr. WC9.

1.5 VALVE CHARACTERISTICS SHALL BE EQUAL PERCENTAGE.

1.6 VALVE TYPE SHALL BE FLOW TO CLOSE.

1.7 THE VALVE SHALL BE IBR APPROVED. (01)

1.8 THE VALVE MUST BE DESIGNED KEEPING IN VIEW OF THE FOLLOWING DATA:

(i) AMBIENT TEMPERATURE: 4°C TO 55°C
(ii) AVERAGE RALATIVE HUMIDITY : 66%
(iii) MAX. ERTHQUAKE FACTORS HORIZONTAL : 0.3g (Limit of integrity)
(iv) MAX. EARTH QUAKE FACTORS VERTICAL : 0.2g (Limit of integrity)
(v) NOISE LEVEL AT 1M DISTANCE: <= 90 dB(A)

1.9 FUNCTION OF VALVE ACTUATOR SHALL BE 'AIR TO OPEN AND SPRING TO CLOSE'.

1.10 SMART TYPE POSITINER, AIR VOLUME BOOSTER, AIR LOCKING SYSTEM FOR STAYPUT ACTION ,FILTERS, STOP VALVES, ASSOCIATED PIPES AND CONNECTORS SHALL BE SUPPLIED BY THE VENDOR ALONG WITH THE ACTUATOR.

1.11 ADDITIONAL SPECIFICATIONS OF SMART POSITIONER AS PER DOCUMENT NO. 4-18102-50001 SHALL BE COMPLIED BY THE VENDOR.

1.12 AN ELECTRO-PNEUMATIC CONTROLLER SIPART PS2 BY SIEMENS COMPANY OR ARCAPRO 827A BY ARCA COMPANY IS NOT ALLOWED TO BE INSTALLED.

1.13 MOUNTING POSITION OF THE VALVE SHALL BE HORIZONTAL WITH VERTICAL SPINDLE.

1.14 HANDWHEEL SHALL BE PROVIDED IN THE ACTUATOR FOR MANUAL OPERATION. PROVISION SHALL BE PROVIDED BY THE SUPPLIER FOR MANUAL RELEASE OF AIR WHICH GETS TRAPPED IN THE ACTUATOR IN CASE VALVE IS ON 'STAYPUT' DURING AIR SUPPLY FAILURE.

1.15 THE FOLLOWING ITEMS SHALL BE INCLUDED IN THE OFFER AS COMMISSIONING SPARES:

(i) PACKING AND GASKETS: 1 SET.
(ii) LOCK WASHER FOR FLANGE: 1 COMPLETE SET FOR EACH FLANGE CONNECTION.

1.16 GASKET MATERIAL MUST BE PROVDED FREE FROM HARMFUL POLLUTIONS LIKE ASBESTOS AND FERRITE AND SHOULD HAVE AN EXTRAORDINARY TEMPEATURE RESISTANCE.

2. TESTING REQUIREMENTS:

2.1 Cv TEST SHALL BE CARRIED OUT BY THE SUPPLIER FOR THE VALVE & TEST REPORT SHALL BE SUBMITTED FOR BHEL REVIEW. THE Cv TEST CAN BE CARRIED OUT PHYSICALLY ON THE VALVE OR THROUGH COMPUTER SIMULATION. IN CASE TEST REPORT IS ALREADY AVAILABLE WHICH IS NOT MORE THAN 5 YEARS OLD, THE SAME SHALL BE ACCEPTABLE. FURTHER, IN CASE THE OFFERED VALVE IS ALREADY IN SUCCESSFUL OPERATION USING THE SAME VALVE BODY, SEAT & TRIM COMBINATION AS OF THE OFFERED VALVE, THE VENDOR MAY FURNISH NAME OF PROJECT, DATA SHEET, CROSS-SECTIONAL DRAWING OF THAT VALVE FOR REVIEW IN LIEU OF THE CV TEST REPORT.

(01)

2.2 FOLLOWING TESTS SHALL BE PERFORMED ON THE VALVE & TEST REPORTS SHALL BE SUBMITTED FOR BHEL REVIEW:-

2.2.1 SHELL STRENGTH TEST AS PER TEST P10 OF EN12266 PART-1 (LATEST ADDITION) OR EQUIVALENT TEST AS PER ANSI/ASME STANDARED.

2.2.2 SHELL TIGHTNESS TEST AS PER TEST P11 OF EN12266 PART-1 (LATEST ADDITION) OR EQUIVALENT TEST AS PER ANSI/ASME STANDARED.

2.2.3 SEAT TIGHTNESS TEST AS PER EN60534-4 (LATEST ADDITION) OR ANSI FCI 70-2 (LATEST EDITION). ACCEPTANCE CRITERIA LEAKAGE CLASS-IV.

2.2.4 VALVE SHALL BE FUNCTIONALLY TESTED TO CHECK IT'S DESIGN CHARACTERISTICS.

2.3 RT & UT SHALL BE PERFORMED ON VALVE COMPONENTS AS PER ASME B16.34.

3. DOCUMENTS TO BE SUBMITTED BY THE SUPPLIER:

3.1 DOCUMENTS TO BE SUBMITTED ALONGWITH THE OFFER:

(i) DATA SHEET OF VALVE & ACTUATOR.
(ii) SIZING CALCULATIONS OF VALVE & ACTUATOR.
(iii) CROSS-SECTIONAL DRAWING OF VALVE ALONGWITH BILL OF MATERIAL.
(iv) VALVE CHARACTERISTIC CURVES.
(v) GENERAL ARRANGEMENT DRAWING OF VALVE ALONG WITH ACTUATOR INDICATING OVERALL DIMENSIONS, REQUIRED MAINTENANCE SPACE, DETAILS OF WELD ENDS, OVERALL ASSEMBLY WEIGHT & DIRECTION OF FLOW.
(vi) HOOK-UP DIAGRAM ALONG WITH IT'S FUNCTIONAL WRITE-UP.
(vii) CATALOGUES AF ALL ACCESSORIES eg. POSITIONER, VOLUME BOOSTER, AIR LOCK RELAY, AIR FILTER & REGULATOR.
(viii) REQUIRED SUPPLY AIR PRESSURE, SPRING RANGE, TUBING/CONNECTION SIZE.
(ix) RECOMMENDED QUALITY & QUANTITY OF AIR.
(x) LIST OF COMMISSIONING SPARES.
(xi) PRICED LIST OF RECOMMENDED SPARES FOR FUTURE ORDERING.

3.2 DOCUMENTS TO BE SUBMITTED IN THE EVENT OF ORDERING:

(i) IN THE EVENT OF ORDERING THE FOLLOWING DOCUMENTS ARE REQUIRED TO BE SUBMITTED WITHIN 4 WEEKS OF PLACEMENT OF PURCHASE ORDER & GOT APPROVED BY BHEL BEFORE START OF ANY MANUFACTURING ACTION.
(a) VALVE & ACTUATOR DATASHEET.
(b) CROSS-SECTIONAL DRAWING OF VALVE ALONGWITH BILL OF MATERIAL.
(c) GENERAL ARRANGEMENT DRAWING OF VALVE ALONG WITH ACTUATOR INDICATING OVERALL DIMENSIONS, REQUIRED MAINTENANCE SPACE, DETAILS OF WELD ENDS, OVERALL ASSEMBLY WEIGHT & DIRECTION OF FLOW.
(d) HOOK-UP DIAGRAM OF VALVE WITH ACTUATOR, POSITIONER, FILTERS & GAUGES ETC.
(ii) 25 HARD COPIES OF O&M MANUAL SHALL BE SUPPLIED BY THE VENDOR. OUT OF THESE, 3 COPIES SHALL BE SENT TO SITE ALONGWITH THE EQUIPMENT & REMAINING 22 COPIES SHALL BE SENT TO BHEL, HARIDWAR WITHIN 12 WEEKS OF PLACEMENT OF P.O.

4. GENERAL REQUIREMENTS :-

4.1 GUARANTEE:

GUARANTEE/WARRENTEE PERIOD SHALL BE 24 MONTHS FROM THE DATE OF SHIPMENT OR 18 MONTHS FROM THE DATE OF COMMISSIONING, WHICHEVER IS EARLIER. INCASE OF ANY FAILURE OR TROUBLE REPORTED FROM THE SITE, THE SUPPLIER WOULD DEPUTE THEIR REPRESENTATIVE IMMEDIATELY TO ATTEND THE PROBLEM AND REPLACE THE DEFECTIVE COMPONENT/PARTS IF REQUIRED.

4.2 PAINTING:

THE PAINTING SURFACE SHALL BE PREPARED ACCORDING TO ISO 8503-1 Sa 2 1/2. WELDING END SHALL BE 80mm PAINT FREE. VALVE BODY IS TO BE PAINTED WITH ALUMINIUM PAINT AS PER IS:13183 Gr.1 WITH PAINT THICKNESS OF MINIMUM 70 MICRONS.

4.3 PACKING & DESPATCH:

(i) THE VALVE SHALL BE PACKED AND LOCKED IN SUCH A WAY, THAT IN GENERAL CASE ANY DAMAGE IS PROHIBITTED.
(ii) ALL OPENINGS SHALL BE PLUGGED.
(iii) AS FAR AS POSSIBLE NECESSARY ACCESSORY DEVICES FOR TRANSPORTATION PURPOSE SHALL BE ATTACHED TO THE VALVE AND/OR TO THE PACKING e.g. LIFTING EYES & LIFTING SIGNS.
(iv) BEARING AREAS SHALL BE MARKED IF NECESSARY.

4.4 THE SUPPLIER SHALL BEAR FULL RESPONSIBILITY FOR COMPLIANCE OF ALL THE PART & COMPONENTS SUPPLIED PURSUENT TO THIS SPECIFICATION WITH THE FULL SCOPE OF SAFETY REGULATIONS OF THE COUNTRY.

MAT. CODE : W90313240353

GMS No./ CBOM No.	AGREED DEPT	NAME	SIGN	STATUS OF DRG U DATE
	CIE	B.S.RANA	-sd-	16.11.12
	PED	R.PANJA	-sd-	07.11.12

GRADE OF UNTOL.DIM
M/CG.-C/M/F AA0230208
WELDING-A/B/C/D AA0621104
GAS CUTTING-'T3'AA0621101

REV	DATE	ALTERED / CHECKED
01	01.05.13	ALTERED KJSS / CHECKED SHUBHAM

CHANGES MADE AS PER C.A.NO. STE-13-F0183

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: STEAM TURBINE

BHARAT HEAVY ELECTRICALS LTD. RANIPUR, HARDWAR

	NAME	SIGN	DATE
DRN	RAKESH	- sd -	05.11.12
CHD	S.MITTAL	- sd -	05.11.12
APPD	RCA	- sd -	05.11.12

NO. OF VAR 73 74

DEPT	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS
STE	NTS	-	-		75 77
CODE 4011					

TITLE: LEAK STEAM CONTROL VALVE WITH PNEU. ACT.

CARD CODE 7

DRAWING NO. 2-13240-51000 22 23 24

SHEET No. 02 | No. OF SHEETS 02

12436-984131 Ref.Drawing No>

Sign & Date

Inventory No

SIZE A2

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN mm) FORM DG 39(B)

REV	DATE	ALTERED / CHECKED	REV	DATE	ALTERED / CHECKED	~~GMS No.~~/ C.B.O.M.– NO.	STATUS OF DRG
							U

ZONE		ZONE		AGREED DEPT	NAME	SIGN	DATE

GRADE OF UNTOL.DIM	M/CG. – AA0230208 m	WELDING–CLASS 'B' OF AA0621104	GAS CUTTING–TABLE 3 OF AA0621101

SPARES APPLICABLE FOR LEAK OFF STEAM VALVE WITH PNEUMATIC ACTUATOR

SL.NO.	DESCRIPTION	QUANTITY
01.	ACTUATOR ALONG WITH ACCESSORIES	02 NO.
02.	VALUE TRIM (INCLUDING PLUG, STEM, SEAT RING GUIDE BUSINGS E.T.C.)	01 SET
03.	DIAPHRAGMS, O RING, SEALS	01 SET

NOTES:–

1. ALL THE MANDATORY SPARES SPECIFIED ABOVE SHALL BE MANUFACTURED EXACTLY SAME AS AGAINST MAIN SUPPLY.
2. INTERCHANGEABILITY OF THE MENTIONED ITEMS ARE FOR REPLACEMENT WITH THEIR PARTS FOR WHICH SUPPLY IS TO BE MADE AGAINST MAIN OFFER.
3. ALL THE SPARES MUST BE PACKED IN SEALED TRANSPARENT PLASTIC BAGS AND CLEARLY MARKED OR LABELLED ON THE OUTSIDE OF THE PACKING WITH ITS DESCRIPTION & ASSEMBLY PART NUMBERS.
4. QUALITY CHECKS & TESTING NORMS/REQUIREMENTS AS PER AGREED QUALITY PLAN (QP) SHALL ALSO BE APPLICABLE FOR ALL THE SPARES AS LISTED.

– Ref.Drawing No>

Sign & Date

MAT. CODE: W9931340408

BHARAT HEAVY ELECTRICALS LTD.
RANIPUR, HARDWAR

	NAME	SIGN	DATE	NO. OF VAR
DRN	H.SINGH	–sd–	30.11.15	–
CHD	A.K.S	–sd–	30.11.15	
APPD	N. NIRALA	–sd–	30.11.15	

Inventory No.

DEPT STE / CODE 4011	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM No.	NO. OF ITEMS
	–	–	–	–	–

TITLE :
SPARES FOR LEAK OFF STEAM CONTROL VALVE

CARD CODE

DRAWING NO. 4–13240–59001 (7 22 23 24) –

SHEET No. 01 | No. OF SHEETS 01

A4 SIZE

ANNEXURE-B

Check –List for Leak off steam valve (Material code: W90313240353), Drawing. No. 21324051000, Rev. 01

SL No.	BHEL SPECIFICATION REQUIREMENT	Vendor's confirmation/ Remark
1	**Valve body material:** ASTM A217 Gr. WC9	
2	**Counter Flange material:** SA182 Gr. F22C3	
3	**Valve Class:** 300.	
4	**Valve Characteristics:** Equal %	
5	**Counter flange End connection details:** i. Inlet : 508X9.53, Butt welded as per fig.4 of ASME B16.25 ii. Outlet : 508X9.53, Butt welded as per fig.4 of ASME B16.25	
6	**Controllable range of Cv**	
7	**Hand wheel for manual operation shall be provided.**	
8	**Manual vent valve shall be provided.**	
9	**Following commissioning spares shall be provided:** **i.Packing & gaskets 1 set.** **ii. washers for flange: 1 complete set for each flange connection.**	
10	**Valve shall be IBR approved.**	
11	**Testing of valve as per cl. no. 2.2 of BHEL specification.**	
12	**Paint as per cl. no. 4.2 of BHEL specification or equivalent**	
13	**End connection in actuator for air supply:** 3/4" pipe connector (CS, weldable) to be supplied by the vendor	
14	**Failure mode: stay put**	
15	**Cv test report submission after placement of P.O.**	
16	**Operating time < 3 sec**	
17	**Weight of complete assembly of valve along with actuator<2500 Kg**	
18	**Valve leakage class-IV as per ANSI FCI 70-2**	
19	**Function of Actuator:** Air to open spring to close	
20	**Type of drive of actuator: spring diaphragm**	
21	**Recommended quality and quantity of air**	
22	**Required supply air pressure**	
23	**Documents submission for BHEL approval within 4 weeks after placement of P.O. as per cl. no. 3.2 of BHEL specification.**	
24	**O & M Manual:** Submission of 25 Hard copies (3 copies along with equipment to the site & remaining 22 to BHEL, Hardwar within 12 weeks of placement of P.O.).	

ANNEXURE-C

Seal steam supply valve/ Leak off steam control valve - Check List for Documents/Information to be furnished along with the offer

SL. No.	Document/Information details	Enclosed with the offer	
		Yes	No
1	Data sheet of valve and actuator		
2	Sizing calculation of valve and actuator		
3	General arrangement drawing of valve along with actuator indicating: i. overall dimensions, ii. required maintenance space, iii. details of weld ends, iv. overall assembly weight v. direction of flow		
4	Recommended quality and quantiy and supply pressure of actuator air		
5	Hook up diagram along with its functional write up		
6	Detailed catalogue mentioning type of position transmitter position controller, volume booster, air lock relay, air filter and regulator		
7	Priced list of recommended spare parts as perBHEL Drg. 31323900001 for future ordering.		

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN			TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM	SEAL STEAM LEAK STEAM VALVE	QP NO.	QA_BI_QP_111	
				DATED	04/06/2013	
		DRG. NO.	AS PER PO			
		SPEC.	AS PER PO			
		REV	01	Page 1 of 3		

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	D	AGENCY M	AGENCY B	AGENCY N	REMARKS
1	2	3	4	5	6	7	8	9		10			11
1.	Body / Bonnet	Mechanical Properties	CR	Physical Test	100%	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	TC	√	P	V		
		Chemical Analysis	CR	Chemical Testing	100%	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	TC	√	P	V		
		Heat Treatment	CR	Time & Temp.	100%	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	TC	√	P	V		
		Internal Soundness	CR	Radiography	100%	ASME B 16.34	ASME 16.34 APPDX.1	IR	√	P	V		
		Hydraulic Test	CR	Hydraulic Test	100%	ANSI B 16.5	No Leakage	IR	√	P	V		
2.	Trim (Plug, Seat, Stem)	Mechanical Properties	MA	Physical Test	100%	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	TC	√	P	V		
		Chemical Analysis	MA	Chemical Testing	100%	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	TC	√	P	V		
3.	Studs and Nuts	Mechanical Properties	CR	Physical Test	One Per Lot	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	COC	√	P	V		
		Chemical Analysis	CR	Chemical Testing	One Per Lot	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	COC	√	P	V		
4.	Packing and Other Internal Parts	Material & Functional Tests	MA	As required by relevant Standard	Sample	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	COC	√	P	V		
	Actuator	Model	MA	Verify	Sample	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	COC	√	P	V		
		Functional Test	MA	Leakage	Sample	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	COC	√	P	V		

		LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY Sanjeev 20/04/2016 संजीव कुमार भारद्वाज Sanjeev Kumar Bhardwaj अभियन्ता/Engineer

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN			TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM	SEAL STEAM LEAK STEAM VALVE	QP NO.	QA_BI_QP_111		
				DATED	04/06/2013		
		DRG. NO.	AS PER PO				
		SPEC.	AS PER PO				
		REV	01		Page 2 of 3		

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY			REMARKS
										M	B	N	
1	2	3	4	5	6	7	8	9	D	10			11
	Positioner	Model	MA	Verify	Sample	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	COC	√	P	V		
		Functional Test	MA	Testing With Valve	Sample	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	COC	√	P	V		
5.	Complete Valve S/A	Hydraulic Test	CR	Hydraulic Test	100%	ANSI B 16.5 / 16.37 / 16.34	No Leakage	Assembly Quality plan	√	P	W		
		Seat Leakage Test	CR	Leak test	100%	ANSI B 16.104 FCI-70-2	Leakage Class IV	Assembly Quality plan	√	P	W		
		Packing Tightness / Gasket Leakage	CR	Leak test	100%	Vendor's Standard	Vendor's Standard	Assembly Quality plan	√	P	W		
		Operating Test (Opening & closing Time)	CR	Performance	100%	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	Assembly Quality plan	√	P	W		
		Flow Capacity Test	CR	Valve Full Capacity	One Per Type	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	TC	√	P	V		BHEL Approved CV Test Report
	Final Inspection												

		LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR		ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		APPROVED BY Sanjeev 20/04/2016

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN			TO BE FILLED BY BHEL	TO BE FILLED BY BHEL
BHEL	VENDOR'S NAME	ITEM	SEAL STEAM LEAK STEAM VALVE	QP NO.	QA_BI_QP_111		
				DATED	04/06/2013		
		DRG. NO.	AS PER PO				
		SPEC.	AS PER PO				
		REV	01		Page 3 of 3		

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS		AGENCY			REMARKS
										M	B	N	
1	2	3	4	5	6	7	8	9	D	10			11
	Painting	Color & Thickness	MA	Coating Thickness	100%	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	Conformity test	√	P	V		
	Overall Dimensions	Overall Dimensions Inspection	MA	End to End dimensions	100%	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	Conformity test	√	P	V		
6.	Complete Valve S/A & Packing	Verification	MA	Verification	100%	Appd. Datasheet/Drg.	Appd. Datasheet/Drg.	Assembly Quality plan	√	P	V		

*Note : All valves to be witnessed by BHEL nominated agency.

		LEGEND: ! RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE	
MANUFACTURER/SUBCONTRACTOR				APPROVED BY Sanjeev 20/04/2016