TECHNICAL SPECIFICATION FOR
VALVES PACKAGE & VALVE SPARES PACKAGE

1.0 SCOPE:

Supply of valves, spares for valves shall be as per the Annexure as mentioned in the Variant Table

2.0 COMPLIANCE WITH STANDARDS:

2.1 Dimensions, Tolerances and other requirements as per individual standards listed in Annexure mentioned at Variant Table

(Copies of BHEL standards referred in concerned Annexure to be enclosed by Purchase Dept.)

3.0 MATERIAL:

As indicated in individual item description / as per individual standards listed in Annexure mentioned at Variant Table

4.0 SIZES:

As indicated in individual item description listed in concerned Annexure mentioned at Variant Table

5.0 TECHNICAL DELIVERY CONDITIONS:

As per corporate standard No. AA0851403 **(A copy to be enclosed by Purchase Dept.)**

6.0 IBR ATTESTATION:

As indicated against individual item in Annexure mentioned at Variant Table

VARIANT TABLE

Var No.	Project	ANNEXURE/DOC NO	Matl code
01	GGSR NAPTHA CONVERSION-HRSG	PEMC-05110	PY9752053017
02	GGSR NAPTHA CONVERSION-GTG	PEMC-05111	PY9752053025
03	RSCL-KNIFE GATE VALVES PACKAGE	PEMC-07416	PY9752053033
04	RSCL-BUTTERFLY VALVES PACKAGE	PEMC-07417	PY9752053041
05	RSCL-CHECK VALVES PACKAGE	PEMC-07418	PY9752053050
06	RSCL-SLUICE GATES PACKAGE	PEMC-07419	PY9752053068
07	HPVP PROJECT-SLUICE GATES PACKAGE		PY9752053076
08	VALVE PACKAGE-TRICHY SCOPE-ONGC URAN		PY9752053084
09	VALVE PACKAGE MAIN WO-BHEL TRICHY-IOCL PARADIP		PY9752053092
10	SPARES VAL PKG# 1 (GTV GLV SCV)-FC IOCL	PEMC-07539	PY9752053106
11			
12			
13	SPARES VALVE PKG# 2(GTV)-FC IOCL PARADIP	PEMC-07540	PY9752053130
35	RDA-BUTTERFLY VALVES PACKAGE	PEMC-07576	PY9752053351
36	RDA-CHECK VALVES PACKAGE	PEMC-07577	PY9752053360
37	RDA-KNIFE GATE VALVES PACKAGE	PEMC-07578	PY9752053378
38	RDA-SLUICE GATES PACKAGE	PEMC-07579	PY9752053386
39	RDA-BALL VALVES PACKAGE	PEMC-07580	PY9752053394

RECORD OF REVISIONS

Rev. No.	Date	Revision Details	Revised	Approved
00	10.11.14	First Issue	SVN R	VVSS S
01	19.06.19	Variants 03, 04, 05 & 06 are added	UP	GKC
02	17.07.2021	Spec Title change to valves package & valve spares package for used in both main and spares valves package.	FRK	GKC
03	11.11.2021	Variants 35, 36, 37, 38 & 39 are added	UP	GKC

BALL VALVES PACKAGE

for

RAIPUR DEVELOPMENT AUTHORITY 6 NO. STP'S

1.0 SCOPE OF SUPPLY

This document indicates the requirements to be considered for supply of Ball Valves, for 6 units of STP, Raipur Development Authority (RDA) Project.

Following are the 6 units of STP:

1) 7.40 MLD STP KAMAL VIHAR, RAIPUR
2) 7.05 MLD STP SEC-12, KAMAL VIHAR, RAIPUR
3) 4.33 MLD STP SEC-6, KAMAL VIHAR, RAIPUR
4) 3.98 MLD STP INDRAPRASTHA, RAIPUR
5) 1.79 MLD STP SEC-11a, KAMAL VIHAR, RAIPUR
6) 0.872 MLD STP SEC-11b, KAMAL VIHAR, RAIPUR

The supplies shall meet the requirements of the following technical datasheet and unit-wise valve schedule, without any deviations:

- Technical Datasheet for Ball valves _ Pg 3 of 9
- Ball Valve Schedule for 7.40 MLD STP KAMAL VIHAR, RAIPUR_ Pg 4 of 9
- Ball Valve Schedule for 7.05 MLD STP SEC-12, KAMAL VIHAR, RAIPUR_ Pg 5 of 9
- Ball Valve Schedule for 4.33 MLD STP SEC-6, KAMAL VIHAR, RAIPUR_ Pg 6 of 9
- Ball Valve Schedule for 3.98 MLD STP INDRAPRASTHA, RAIPUR_ Pg 7 of 9
- Ball Valve Schedule for 1.79 MLD STP SEC-11a, KAMAL VIHAR, RAIPUR_ Pg 8 of 9
- Ball Valve Schedule for 0.872 MLD STP SEC-11b, KAMAL VIHAR, RAIPUR_ Pg 9 of 9

2.0 NOTES:

2.1 Bidder shall obtain necessary clarifications (if any) from BHEL, before bid submission. This is a no deviation tender and no deviation or price implication is acceptable after bid submission.

2.2 Bidder shall submit the following along with their bid:

- No Technical Deviation Certificate.
- Unpriced price bid format (Pg no. 4 to 9)

+ + +

RECORD OF REVISIONS:

Rev No	Date	Revision Detail	Revised by	Approved by
00	11.11.2021	FIRST ISSUE	U Pradeep	Srikanth G

DATA SHEET:		BALL VALVE	PEMC-07580, Page 3 of 9
PROJECT:		RDA STPs, RAIPUR	
Sr No	Description	Particulars	Vendor's Confirmation
A	GENERAL		
	Make	*	
	Description	Manually operated ball valve	
	Design standard	BS EN ISO 17292	
	Test standard	BS EN 12266 PART-1 AND 2	
	Duty	On - Off	
B	OPERATING CONDITIONS		
	Operating pressure	Refer Valve Schedule	
	Test pressure (Body)	1.5 times operating pressure	
	Test pressure (Seat)	1.1 times operating pressure	
	Fluid handled	Air / Treated & Raw Sewage / Plant drain / Sludge / Polymer Solution	
	pH of fluid handled	6.5-8.5	
	Design Temperaature	120 ^{0} C for Air / 45 ^{0} C for sewage, centrate, plant drain	
C	CONSTRUCTION FEATURES		
	Ends connections	As per Attached Valve Schedule	
	Operation	Lever operated	
	Open/ close indication	Required	
D	MATERIAL OF CONSTRUCTION		
	Body	ASTM A 216 WCB/IS:210 Gr FG260/SS 304	
	Inner Lining	SS 304	
	Ball (Solid)	SS304	
	Seat	SS 304	
	Stem	SS 304	
	Gland Packing/ Bushing	*	
	Lever	Mild Steel (With PP/ PVC Cladding)	
	Stem/body seal	*	
	Bolts & nuts	High tensile steel hot dip galvanised (not in contact with fluid) SS 304 (in contact with Fluid)	
E	QUANTITY		
	Size	As per attached Valve Schedule	
	Quantity		
	Fluid handled		
	Flange drilling Standard		
F	PAINTING		
	Surface Finish	SA 2.5	
	Painting	Epoxy Painting, minimum 200 micron DFT	
	Note:		
1	Where ever the line pressure is low, manufacturer to provide a positive leak free seal		
2	Valve Tag, size, PN rating & Brand name shall be provided on valve body.		

7.40 MLD STP KAMAL VIHAR, RAIPUR_ Valve Schedule												PEMC-07580, Page 4 of 9
SR. NO.	TAG NO.	QTY	LINE MOC	SIZE (NB)	TYPE	LOCATION	SERVICE	SUITABLE	OPERATION	VALVE MOC	UNIT RATE	TOTAL PRICE
1	1.8	12	MS	40	BALL VALVE	SELECTOR DOWN COMER SBR BASIN 1 & 2	AIR	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
2	23.2	2	SS	80	BALL VALVE	DWPE DOSING TANK DRAIN	POLYMER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
3	23.3	2	SS	25	BALL VALVE	DWPE DOSING TANK OUTLET	POLYMER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
4	24.2	2	SS	25	BALL VALVE	DWPE DOSING PUMP SUCTION	POLYMER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
5	24.3	2	SS	25	BALL VALVE	DWPE DOSING PMP DISCHARGE	POLYMER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
6	24.4	2	SS	25	BALL VALVE	DWPE DOSING TANK SERVICE WATER SUPPLY	WATER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
7	27.2	2	GI	50	BALL VALVE	SERVICE WATER PUMP SUCTION	WATER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
8	27.4	2	GI	50	BALL VALVE	SERVICE WATER PUMP DISCHARGE	WATER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
9		4	SS	25	BALL VALVE	CENTRIFUGE FEED PUMPS FLUSHING	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
10		4	SS	25	BALL VALVE	CENTRIFUGE FEED PUMPS PI & DRAIN	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
11		4	SS	25	BALL VALVE	SERVICE WATER PUMPS PI & DRAIN	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		

7.05 MLD STP SEC-12, KAMAL VIHAR, RAIPUR_ Valve Schedule												PEMC-07580, Page 5 of 9
SR. NO.	TAG NO.	QTY	LINE MOC	SIZE (NB)	TYPE	LOCATION	SERVICE	SUITABLE	OPERATION	VALVE MOC	UNIT RATE	TOTAL PRICE
1	1.8	12	MS	40	BALL VALVE	SELECTOR DOWN COMER SBR BASIN 1 & 2	AIR	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
2	23.2	2	SS	80	BALL VALVE	DWPE DOSING TANK DRAIN	POLYMER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
3	23.3	2	SS	25	BALL VALVE	DWPE DOSING TANK OUTLET	POLYMER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
4	24.2	2	SS	25	BALL VALVE	DWPE DOSING PUMP SUCTION	POLYMER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
5	24.3	2	SS	25	BALL VALVE	DWPE DOSING PMP DISCHARGE	POLYMER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
6	24.4	2	SS	25	BALL VALVE	DWPE DOSING TANK SERVICE WATER SUPPLY	WATER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
7	27.2	2	GI	40	BALL VALVE	SERVICE WATER PUMP SUCTION	WATER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
8	27.4	2	GI	40	BALL VALVE	SERVICE WATER PUMP DISCHARGE	WATER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
9		4	SS	25	BALL VALVE	CENTRIFUGE FEED PUMPS FLUSHING	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
10		4	SS	25	BALL VALVE	CENTRIFUGE FEED PUMPS PI & DRAIN	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
11		4	SS	25	BALL VALVE	SERVICE WATER PUMPS PI & DRAIN	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		

4.33 MLD STP SEC-6, KAMAL VIHAR, RAIPUR_ Valve Schedule												PEMC-07580, Page 6 of 9
SR. NO.	TAG NO.	QTY	LINE MOC	SIZE (NB)	TYPE	LOCATION	SERVICE	SUITABLE	OPERATION	VALVE MOC	UNIT RATE	TOTAL PRICE
1	1.8	12	MS	32	BALL VALVE	SELECTOR DOWN COMER SBR BASIN 1 & 2	AIR	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
2	23.2	2	SS	50	BALL VALVE	DWPE DOSING TANK DRAIN	POLYMER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
3	23.3	2	SS	25	BALL VALVE	DWPE DOSING TANK OUTLET	POLYMER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
4	24.2	2	SS	25	BALL VALVE	DWPE DOSING PUMP SUCTION	POLYMER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
5	24.3	2	SS	25	BALL VALVE	DWPE DOSING PMP DISCHARGE	POLYMER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
6	24.4	2	SS	25	BALL VALVE	DWPE DOSING TANK SERVICE WATER SUPPLY	WATER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
7	27.2	2	GI	50	BALL VALVE	SERVICE WATER PUMP SUCTION	WATER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
8	27.4	2	GI	40	BALL VALVE	SERVICE WATER PUMP DISCHARGE	WATER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
9		4	SS	25	BALL VALVE	CENTRIFUGE FEED PUMPS FLUSHIN	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
10		4	SS	25	BALL VALVE	CENTRIFUGE FEED PUMPS PI & DR	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
11		4	SS	25	BALL VALVE	SERVICE WATER PUMPS PI & DRAIN	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		

3.98 MLD STP INDRAPRASTHA_ Valve Schedule												PEMC-07580, Page 7 of 9
SR. NO.	TAG NO.	QTY	LINE MOC	SIZE (NB)	TYPE	LOCATION	SERVICE	SUITABLE	OPERATION	VALVE MOC	UNIT RATE	TOTAL PRICE
1	1.8	12	MS	32	BALL VALVE	SELECTOR DOWN COMER SBR BASIN 1 & 2	AIR	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
2	23.2	2	SS	50	BALL VALVE	DWPE DOSING TANK DRAIN	POLYMER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
3	23.3	2	SS	25	BALL VALVE	DWPE DOSING TANK OUTLET	POLYMER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
4	24.2	2	SS	25	BALL VALVE	DWPE DOSING PUMP SUCTION	POLYMER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
5	24.3	2	SS	25	BALL VALVE	DWPE DOSING PMP DISCHARGE	POLYMER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
6	24.4	2	SS	25	BALL VALVE	DWPE DOSING TANK SERVICE WATER SUPPLY	WATER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
7	27.2	2	GI	50	BALL VALVE	SERVICE WATER PUMP SUCTION	WATER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
8	27.4	2	GI	40	BALL VALVE	SERVICE WATER PUMP DISCHARGE	WATER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
9		4	SS	25	BALL VALVE	CENTRIFUGE FEED PUMPS FLUSHING	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
10		4	SS	25	BALL VALVE	CENTRIFUGE FEED PUMPS PI & DRAIN	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
11		4	SS	25	BALL VALVE	SERVICE WATER PUMPS PI & DRAIN	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		

1.79 MLD STP SEC-11a, KAMAL VIHAR, RAIPUR_ Valve Schedule												PEMC-07580, Page 8 of 9
SR. NO.	TAG NO.	QTY	LINE MOC	SIZE (NB)	TYPE	LOCATION	SERVICE	SUITABLE	OPERATION	VALVE MOC	UNIT RATE	TOTAL PRICE
1	1.8	12	MS	25	BALL VALVE	SELECTOR DOWN COMER SBR BASIN 1 & 2	AIR	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
2	23.2	2	SS	50	BALL VALVE	DWPE DOSING TANK DRAIN	POLYMER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
3	23.3	2	SS	25	BALL VALVE	DWPE DOSING TANK OUTLET	POLYMER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
4	24.2	2	SS	25	BALL VALVE	DWPE DOSING PUMP SUCTION	POLYMER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
5	24.3	2	SS	25	BALL VALVE	DWPE DOSING PMP DISCHARGE	POLYMER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
6	24.4	2	SS	25	BALL VALVE	DWPE DOSING TANK SERVICE WATER SUPPLY	WATER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
7	27.2	2	GI	50	BALL VALVE	SERVICE WATER PUMP SUCTION	WATER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
8	27.4	2	GI	40	BALL VALVE	SERVICE WATER PUMP DISCHARGE	WATER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
9		4	SS	25	BALL VALVE	CENTRIFUGE FEED PUMPS FLUSHING	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
10		4	SS	25	BALL VALVE	CENTRIFUGE FEED PUMPS PI & DRAIN	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
11		4	SS	25	BALL VALVE	SERVICE WATER PUMPS PI & DRAIN	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		

0.872 MLD STP SEC-11b, KAMAL VIHAR, RAIPUR_ Valve Schedule												PEMC-07580, Page 9 of 9
SR. NO.	TAG NO.	QTY	LINE MOC	SIZE (NB)	TYPE	LOCATION	SERVICE	SUITABLE	OPERATION	VALVE MOC	UNIT RATE	TOTAL PRICE
1	1.8	12	MS	25	BALL VALVE	SELECTOR DOWN COMER SBR BASIN 1 & 2	AIR	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
2	23.2	2	SS	50	BALL VALVE	DWPE DOSING TANK DRAIN	POLYMER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
3	23.3	2	SS	25	BALL VALVE	DWPE DOSING TANK OUTLET	POLYMER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
4	24.2	2	SS	25	BALL VALVE	DWPE DOSING PUMP SUCTION	POLYMER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
5	24.3	2	SS	25	BALL VALVE	DWPE DOSING PMP DISCHARGE	POLYMER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
6	24.4	2	SS	25	BALL VALVE	DWPE DOSING TANK SERVICE WATER SUPPLY	WATER	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
7	27.2	2	GI	50	BALL VALVE	SERVICE WATER PUMP SUCTION	WATER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - SS Internal - SS		
8	27.4	2	GI	40	BALL VALVE	SERVICE WATER PUMP DISCHARGE	WATER	FLANGE, SUITABLE TO ANSI B16.5, 150#, RF	MANUAL	Body - CS Internal - SS		
9		4	SS	25	BALL VALVE	CENTRIFUGE FEED PUMP	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
10		4	SS	25	BALL VALVE	CENTRIFUGE FEED PUMP	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		
11		4	SS	25	BALL VALVE	SERVICE WATER PUMPS P	SLUDGE	Socket Weld / BSP - SCRD (F) 800#	MANUAL	Body - SS Internal - SS		

TECHNICAL DELIVERY CONDITIONS FOR VALVES

1.0 SCOPE

1.1 This Standard stipulates the Technical Delivery Conditions for Industrial Valves to DIN/ANSI/IS/BS Standards, covering the requirements of constructional features, Accessories, Inspection, Tests, Test Certificates, Documentation, Preservation, Packing and Marking.

1.2 This Standard supplements the individual BHEL Valve Standards and forms a part of the Purchasing Conditions.

1.3 In addition to the general requirements stipulated in this Standard, any special requirements specified on the Enquiry /Purchase Order/Quality plan shall also be complied with.

1.4 The suppliers shall strictly comply with this standard in all respects. No deviations shall be allowed, unless written permission of BHEL is obtained before finalization of the Order.

2.0 CONSTRUCTIONAL FEATURES

Provision of the constructional features given in Table-1 shall be ensured for different types of Valves.

3.0 ACCESSORIES

The accessories mentioned in Table - 2 shall be provided for different types of Valves.

4.0 INSPECTION

4.1 INSPECTION AGENCY

Inspection agency for different categories of valves shall be as follows:

4.1.1 ATTESTED VALVES

For carbon and alloy steel attested valves coming under the purview of IBR (Indian Boiler Regulations), the inspection agency shall be as follows

a) Indigenous Valves: Authorized Inspector of CIB (Chief Inspector of Boilers).

In addition, BHEL representative shall witness the Inspection/Testing at supplier's works (other than BHEL, Tiruchy) for the following categories of valves,

i) All Valves of Class 600 and above
ii) All Valves of size 350 NB and above of all pressure ratings.
iii) All Motor / Gear operated valves,
iv) All valves with BW ends.
v) All valves wit any special features like sealed gland, regulating disc etc.

b) Imported Valves: M/s Lloyds/TUV or any other inspection agency approved by IBR.

4.1.2 NON-ATTESTED (CERTIFIED) VALVES

a) For Cast Iron, Gun Metal and other general purpose Valves (other than Stainless Steel Valves), not coming under the preview of IBR, the supplier's Inspection. Department shall undertake testing/inspection in presence of BHEL representative. However, witnessing of testing/inspection by BHEL representative may be waived off for Cast Iron and gun metal Valves on case to case basis.
b) In case of all Stainless Steel Valves, the inspection agency shall be M/s Lloyds/BHEL Inspectors, unless otherwise specified in the Enquiry / Purchase Order.

4.2 SCOPE OF INSPECTION

The scope of inspection shall be as follows:
(a) All tests listed in Cl.5
(b) Any other tests specified in the Enquiry / Purchase Order / Quality Plan
(c) Stamping of all accepted Valves and issue of Inspection reports and certificates.

5.0 TEST & TEST CERTIFICATES

The tests specified in Table-3 shall be conducted and 5 copies of the relevant test certificates shall be furnished to BHEL along with each consignment. The following abbreviations are used in the table. AI - Authorized Inspector; CS - Carbon Steel; AS - Alloy Steel; SS - Stainless Steel.

6 . 0 GUARANTEE CERTIFICATE

2 copies of the guarantee certificate shall be submitted before dispatch of valves. All the valves shall be guaranteed for trouble free operation for a period of 12 months from the date of commissioning or 24 months from the date of dispatch. The valves found defective due to design deficiency, Manufacturing defects etc., during the guarantee period shall be replaced by the supplier at no extra charge to BHEL.

7.0 DOCUMENTS

7.1 ALONG WITH THE OFFER

4 copies each of the following documents shall be submitted along with the quotation.

i) Drawing/leaflet/catalogue for the offered item indictating complete cross sectional arrangement, standards governing the valves and valve rating, indicating direction of flow by an arrow marked on the body, binding dimensions, bill of materials with material specification details, hydraulic/air test pressure for body/seat/ back seat, overall height, dismantling clearances, weight and special features, if any, as specified in the main specification of the valves.

ii) Quality plan adopted by the supplier during manufacture and inspection / testing of valves.
iii) List of recommended spares for 3 years trouble free operation of valves.
iv) Any deviations to this standard / individual specification proposed by the supplier.
v) Actuator technical data sheet, wiring diagram, limit Switch development diagram.
vi) Regulation characteristics for Regulating globe valve.

The offer submitted without the above mentioned documents shall be considered as incomplete and therefore the offer shall be ignored for the purpose of technical/commercial evaluation.

7.2 AFTER PLACEMENT OF ORDER

7.2.1 Immediately after placement of order as per purchase order the following documents shall be furnished,

i) Certified contract drawings for approval. After approval of the same RTF shall be furnished
ii) Standard Quality plan duly countersigned by the supplier.
iii) Operation and maintenance instructions.
iv) Lubricant recommendation covering the following details:
   a) Item to be lubricated.
   b) Method of lubrication.
   c) Type of lubricant and source of supply.
   d) Frequency of lubrication.

v) Storage instructions.

8.0 CLEANING

Particular care shall be taken to ensure that all foundry sand and loose material is properly removed by fettling/shot blasting.

9.0 PAINTING

Valves shall be painted externally after the hydraulic testing has been carried out. Just before the painting, valve bodies and other items shall be thoroughly cleaned. The valves shall be first painted with red oxide primer followed by 2 coats of spray painting with enamel paint. The colour of the paint shall be Blue for Carbon Steel Valves and Aluminum heat resisting for alloy steel valves. In case of forged steel valves up to 2" phospating may be done instead of painting. For alloy steel forged valves a yellow band may be painted on the body after phosphating.

10.0 MARKING ON VALVES

10.1 BODY

The body of the valve shall have the following markings:

a) Nominal size.
b) Pressure rating.
c) Material grade of body.
d) Supplier's Trade Mark.
e) Arrow showing direction of flow (for globe and check valves).
f) Inspector's' identification mark.

10.2 NAME PLATE

10.2.1 The nameplate shall be fitted below the hand wheel nut for globe/gate valve and on the body/cover for Non-return valves covering the following details.

a) Manufacturer's name.
b) Nominal size,
c) Pressure rating.
d) Material grades of body, bonnet and trim.
e) Manufacturer's identification/serial No.,
f) Year of manufacture.
g) BHEL material code number/Tag No. From Purchase Order.

10.2.2ACTUATOR

A name plate covering the following details shall be fitted to the actuator.

a) Make.
b) Model No.
c) Output shaft r.p.m.
d) K.W. rating

10.3 HAND WHEEL

Hand wheel shall have the working "open" and "shut" - duly cast alongwith the arrow to show direction of closing the valve.

11.0 PRESERVATION

Suitable temporary rust preventive with minimum life of one year shall be applied inside the valve body in order to prevent corrosion.

12.0 END PROTECTION

12.1 FLANGED VALVES

A circular blanking plate made of thin steel s heet, with diameter 6mm less than the bolt holes inner PCD, shall be firmly fixed to the flange faces by the application of adhesive, after ensuring that the flange faces have been thoroughly degreased. A thin coat of adhesive shall be applied to the flang e face and the blanking plate and then allowed to dry for 15 to 20 minutes. The coated face of the blanking plate should then be joined to the face of the flange taking care that the plate is concentric with the flange. Firm pressure shall be applied to ensure intimate contact between the plate and flange.

A wooden blank should then be bolted to the flange using a minimum of four bolts.

12.2 SCREWED, SOCKET & BUTT WELDED VALVES

Valve ends shall be protected from external damage and sealed against the ingress of dirt by means of plastic/ Steel end covers firmly secured.

12.3 Any improved method of end protection can however be considered and the suppliers shall furnish complete details at offer stage.

13.0 PACKING

13.1 All the valves shall be packed suitably in closed wooden cases in order to avoid damage during transit and storage at BHEL. Suitable supports shall be provided inside the cases in order to avoid internal movement. In case of imported consignments the packing shall be seaworthy.

13.2 Each valve after end protection should be wrapped in polythene sheet before packing in the cases.

13.3 Valves of sizes upto Nb 50mm (2") could be packed in one packing case taking care that they do not strike with each other. Enough packing material shall be kept inside the case to avoid damage.

13.4 Valves of size above 50mm (2") shall be packed separately in each case. In case, the handwheel, extension spindle or any other accessory of a valve is removed at the time of packing, the same must be kept in the same case and not separately.

13.5 Each packing case must contain 2 copies of the shipping list giving details of all the contents of the case.

14.0 MARKING

The following marking shall be done on each packing case minimum on two sides and also at the top.

a) Complete address of the consignee and destination as per BHEL Purchase Order.
b) BHEL Purchase Order Number.
c) BHEL Valve Standard Number(s).
d) Number of pieces in each packing case.
e) Net weight.
f) Gross weight.
g) Packing case numbers and total number of packings.
h) Arrow indicating top of the packing case.

CORPORATE STANDARD

TABLE I – CONSTRUCTIONAL FEATURES

CL NO	FEATURE	VALVE TYPE	PRESSURE CLASS ANSI/DIN					
			CL 150	CL 300	CL 600	CL 900	CL 1500	CL 2500
			NP 10&16	NP 25&40	NP 64&100	NP 160	NP 250	NP 320&400
2.1	SPINDLE	GLOBE GATE	Outside screw & Yoke type with rising Spindle					
2.2	BONNET/ COVER	GLOBE GATE CHECK	Bolted to the Body for all sizes		Seal welded for NB50 and below. Pressure sealed for NB65 and above.			
2.3	BORE	GLOBE GATE CHECK	Full bore ANSI rating. For DIN rating		Shall not be less than 80% of the Full Venture Bore area.			
2.4	DISC	GLOBE	Radii used/ Spherical Seating Disc. For NB65 and above, the Disc shall be free to Revolve on the spindle for valves upto C1.900.					
		REGULATING GLOBE	Taper Plug type Disc/Parabolic type Disc. For NB65 and above the disc shall 1 be free to revolve on the spindle					
		SWING CHECK N.R.V	The Body Seat shall be inclined at such an angle from the vertical, to facilitate positive closing and to prevent valve clatter. The friction between hinge pin and bush shall be as minimum as possibilities so as to ensure that The check valve closes when the return of flow is even at a pressure of 1 ata.					
		PISTON LIFT N.R.V	Shall be provided with guided Disc, which enables the back pressure to be utilized fully for postitive disc closing. The fluid collected in the space between disc, body and Cover should act as a damper.					
2.5	WEDGE	GATE	Solid Wedge for upto NB80, Flexible Wedge for NB 100 & above.					
2.6	TRI M	GLOBE GATE N.R.V	Minimum Hardness Values for various trim materials shall be as follows and the seating surface of stainless steel shall have a minimum differential Hardness of 50 BHN					

TABLE I – CONSTRUCTIONAL FEATURES

CL NO	FEATURE	VALVE TYPE	PRESSURE CLASS ANSI/DIN					
			CL 150	CL 300	CL 600	CL 900	CL 1500	CL 2500
			NP 10&16	NP 25&40	NP 64&100	NP 160	NP 250	NP 320&400
2.6	TRIM (Contd.)		Part		Hardness, BHN			
			Stem/Hingepin		200-220			
			Body Seat		250-270			
			Wedge/Disc Seating		300-320			
			Back Seat bush		250-270			
			Thrust Plate (for gate Valves)/		350-370			
2.7	BACK SEAT	GLOBE GATE	Shall be provided for all sizes. For NB65 and above back seat bush will be Provided.					
2.8	DIRECTION OF FLOW	GLOBE	The direction of Flow shall be preferably from bottom to top and the Arrow showing the direction shall be cast on the body.					
2.9	OPENING/ CLOSING	GLOBE GATE	The valves shall close by rotating the Hand Wheel in clockwise Arrow showing the direction shall be cast on the body.					

TABLE – 2 ACCESSORIES

CL NO	FEATURE	VALVE TYPE	PRESSURE CLASS ANSI/DIN					
			CL 150	CL 300	CL 600	CL 900	CL 1500	CL 2500
			NP 10&16	NP 25&40	NP 64&100	NP 160	NP 250	NP 320&400
3.1	Position Indicator	GLOBE GATE REGULATING GLOBE	Shall be provided for all regulating globe valve and other valves of non-rising spindle type.					
3.2	Impact Hand Wheel	GLOBE	Shall be provided wherever necessary.					
3.3	Ball Bearing	GLOBE GATE	Shall be provided wherever necessary for smooth operation.					
3.4	Gear Operation	GATE	Shall be provided for the following sizes for different pressure classes.					
			NB 350& above	NB 300& above	NB 250& above	NB 200& above	NB 150& above	NB 150 above

CORPORATE STANDARD

TABLE – 2 ACCESSORIES (Contd.)

CL NO	REQUIREMENT	VALVE TYPE	PRESSURE CLASS ANSI/DIN					
			CL150	CL300	CL600	CL900	CL1 500	CL2 2500
			NP10&16	NP25&40	NP64&100	NP160	NP 250	NP320&400
3.5	Integral Bypass	GATE	NB 250 & above			NB 200 & above		
			*NOTE: Integral Bypass hall be provided as per MSS:SP-45. The Bypass Pipe shall be seamless, Schedule 80 minimum and of the same material As that of Valve body.					
3.6	EyeBolts	All valves	Suitable eyebolts shall be provided for heavy valves.					

TABLE – 3 TESTS

CL. NO.	TEST	APPLICABLE STANDARD	APPLICABLE COMPONENTS	EXTENT OF TESTING	CERTICATES REQUIRED
5.1	Visual Inspection	MSS-SP55	Steel Castings	100 %	Inspection by 'AI' and then attestation of Manufacturer's certificate by 'AI'
		IS:210	CI Castings		
		IS:318	Gunmetal Castings		
		Manufac-turer's Standard	Forgings and other components	100 %	Verification of Manufac-turer's certificate by 'AI'
5.2	Dimensional Check	Relevant BHEL Standards	Overal dimensions and end connections	100%	IBR, Form IIIc Inspection report by 'AI'
5.3	Material Tests:				
5.3.1	Chemical Analysis	Relevant material Standard	Body, bonnet, Yoke	Each heat/ melt	Material test certificate attested by 'AI'; Body bonnet &yoke shall have identification
5.3.2	Mechanical Tests	-do-	-do-	-do-	-do-

TABLE -3 TESTS

CL.NO	TEST	APPLICABLE STANDARD	APPLICABLE COMPONENTS	EXTENT OF TESTING	CERTIFICATES REQUIRED
5.3.3	Heat Treatment	-do-	Body, Bonnet, Yoke	100%	Inspection Report Test Certificate
5.3.4	Hardness Tests	-do-	Trim	100%	
5.4	Non-dest-tractive tests:				
5.4.1	Radio-graphy	ASTM:E94& E142 CL90050 %	Body& Bonnet Castings	AS:100% CS&SS upto CL 300-10% CL600 to CL 1500 & above -100%	Manufacturer's Certificates with the stamp of 'AI[1]
			Any butt Welded Joints	100%	-do-
5.4.2	Ultrasonic Test	ASTM : 388	Body/Cover Forging	100%	-do-
5.4.3	Magnetic Particle Inspection (MPT)	ASTM: E138/ E709	Trim	100%	-do-
5.4.4	Liquid Penetrant Inspection Dye Pene-trant Ins-pection (LPI/DPI)	ASTM:E165	Seating Surfaces, Spindle Butt Weld-ing ends of valves	100%	-do-
*5.5	Hydraulic Test	API:598	a) Body & Seat b)Back Seat	100% 100%	IBR-Forth IIIC-b/AI Authorised inspector's certificate
*5.6	Air Leak Test	API:598	Seat	100%	-do-

TABLE – 3 TESTS

CL. NO	TEST	APPLICABLE STANDARD	APPLICABLE COMPONENTS	EXTENT OF TESTING	CERTIFICATES REQUIRED
5.7	Functional test on Assembled valves with actuators / gears (with hand wheel on actuator and with electrical actuator)	--	Motor / Gear operated Valves	100%	Authorised Inspector certificates

***Note: Test pressure shall be as given in individual BHEL standards and no leakage shall be allowed during hydraulic/air test. The test duration shall be as follows:**

Nominal Size 'mm'		Minimum Test Duration in seconds		
		Body	Seat	Back Seat
Test Duration	Upto and including 50	15	15	15
	65 upto and including 150	60	60	15
	200 upto and including 300	120	120	15
	350 and above	300	120	15

TABLE 4 – Duration of Required Test Pressure

Valve Size (NPS)	Minimum Test Duration (Seconds)[a]				
	Shall		Back Seat	Closure	
	Check Valves (API Std 594)	Other Valves	All Valves with Backseat Feature	Check Valves (API Std 594)	Other Valves
=2	60	15	15	60	15
2½ -6	60	60	60	60	60
8-12	60	120	60	60	120
=14	120	300	60	120	120

Note: [a]The test duration is the period of inspection after the valves is fully prepared and is under full pressure.

QAP GUIDELINES & FORMAT

`

(ANNEXURE)

The QAP format and guidelines for filling up the format shall be used by vendor for preparation and submission of QAP after order placement.

Note:

1. Typical /Indicative /Standard QAP(s) for equipment /package attached is reference document and to use by successful bidder in future for preparation and submission of QAP for BHEL /CUSTOMER approval.

2. No deviation to reference document is acceptable.

GUIDELINES TO VENDORS FOR PREPARATION OF QUALITY ASSURANCE PLAN

1. QAP shall be made in landscape mode on A4 size paper as per the format enclosed. Font size shall be minimum 10.

2. Each page of QAP shall contain the following information.
   a) Vendor's name & address.
   b) Customer: BHEL, Hyderabad.
   c) Project.
   d) BHEL Product Standard Number/revision number as referred in P.O.
   e) BHEL Purchase Order Number & Date.
   f) Product as per P.O. description.
   g) QAP Number (unique and shall not repeat)/revision number/date.
   h) Page number and number of pages

3. QAP shall contain four parts / stages as follows.
   a) Raw materials and bought out items.
   b) In process Control / Inspection.
   c) Final assembly, Inspection & Testing.
   d) Painting, preservation & packing.

4. Under 'Component', indicate name of the component (say casing, rotor, pressure gauge, etc).

5. Under 'Characteristics', indicate appropriately (say chemical analysis, mechanical properties, NDT (UT, DP etc.), hydrostatic test, calibration check etc.)

6. Under 'Class', indicate minor, major or critical depending on the importance of characteristic.

7. Under 'Type of check', indicate appropriately (say chemical, mechanical, UT, DP etc.)

8. Under 'Quantum of check', indicate appropriately (say 100%, 10%, sample, per melt, per heat, all pieces etc.)

9. Under 'Reference document' and 'Acceptance norms', appropriate National & International standards, BHEL standards, approved drawing references etc. should be indicated. It is not correct to mention as "Vendor's internal standards or Vendor's standard practice etc.". If vendors' internal standards are referred, same shall be in line with BHEL Spec. indicated in the P.O. These may require review & approval by our Engineering dept.

10. Under 'Format of record', indicate appropriately supplier's test certificate, calibration certificate, lab report, inspection report etc.

11. Please refer 'Agency' in QAP format.
    Under P: Perform, W: Witness, V: Verify
    Indicate against each characteristic 1: (BHEL CQS/Nominated inspection agency), OR
    2: (Vendor / Sub vendor)

Note: Performing agency is normally vendor or his sub vendor (Legend 2). Where witness points are indicated in specification, P.O., Drawing etc., for such operations, Under Witness (W) column use 1. Under 'Verify' column, use code1.

12. Under 'D' please put (□ Tick) against each characteristic where vendor proposes to submit test certificate/report etc. OR as required as per BHEL Specification.

13. Vendor's signature & stamp should be available on each page of QAP.

14. Vendor should read the BHEL Product Standard thoroughly and QAP should be made only inline and relevant to the Specification & Approved Drawings.

15. The following operations/characteristics/check points may be included (AS APPROPRIATE)
   a) Visual check
   b) Dimensional check
   c) Mechanical and Chemical properties.
   d) Surface preparation before painting (by chemical cleaning, sand blasting, shot blasting etc. as the case may be.)
   e) Painting check for shade, Dry Film Thickness (DFT), Adhesion/ peel off test etc.
   f) Check for correctness for all components mounted as per General Arrangement Drawing, Bill of Materials (BOM), etc. for range, rating, make, color, size, location as per GA, quantity, label description including tag nos., annunciator facia, loose components, accessories, spares etc.
   g) Verification of test certificate for protection class for the enclosures.
   h) Mechanical functioning of switches.
   i) Continuity of earthing and provision of earth points.
   j) Colour coding of wiring, size, tightness & dressing of wiring.
   k) Review of test certificates of assembled items, raw materials, internal test reports etc.
   l) Witness of functional checks, which may include mechanical run & electrical run, H.V.test, IR measurement, Electrical and Mechanical tests etc.
   m) PQR, WPS, Welder Qualification Record, welding records (fit up, DP) etc.
   n) Material identification (for punch marks of serial numbers, Heat No, Melt No, Inspector's stamp etc.)
   o) Hydraulic Pressure Test, Pneumatic Pressure Test, Liquid Penetration Examination and other Non-Destructive Tests.
   p) Tests on Galvanised items (Visual, Hammer Test, Knife Test, Thickness, Pierce Test (Copper sulphate test), Hydrogen evaluation test, Stripping test (for Mass of Zinc coating)
   q) All tests as per BHEL Product Standard & approved drawings including Type tests and Routine tests on individual items and on System as a whole.
   r) Packing and Preservation.

16. **QAP Format enclosed.**

VENDOR'S NAME & ADDRESS:	**MANUFACTURING QUALITY PLAN**		QP. NO.:	
	CUSTOMER: BHEL, HYDERABAD – 32. PROJECT: PRODUCT:	BHEL P.O.NO.: P.O. DATE: BHEL SPEC: REV:	REV NO:	DATE:
			PAGE 1 OF 1	

SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY P	AGENCY W	AGENCY V	REMARKS
1.0	**RAW MATERIALS & BOUGHT OUT ITEMS**												
2.0	**INPROCESS INSPECTION**												
3.0	**FINAL INSPECTION & TESTING**												
4.0	**PRESERVATION & PACKING**												

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE **1 FOR BHEL/BHEL NOMINATED TPIA** & **2 FOR VENDOR/SUB VENDOR** AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. * FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.	PREPARED BY VENDOR'S SIGNATURE & STAMP	APPROVED BY BHEL QA SIGNATURE & STAMP	APPROVED BY CUSTOMER'S SIGNATURE & STAMP

VENDOR'S NAME & ADDRESS:	**TYPICAL MANUFACTURING QUALITY PLAN**		QP. NO.:	
	CUSTOMER: BHEL, HYDERABAD – 32. PROJECT: PRODUCT:BALL VALVE	BHEL P.O.NO.: P.O. DATE: BHEL SPEC: REV:	REV NO:	DATE:
			PAGE1 OF3	

SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	*	AGENCY			REMARKS
									D	P	W	V	
1.0	**RAW MATERIALS & BOUGHT OUT ITEMS**												
1.1	BODY, BONNET	Chemical & Mechanical Properties, Impact testing	Major	Chem. & Mech. Analysis	One per Melt / Heat	BHEL Spec / Appd Drawing / Appd Datasheet		MTC	✓	2	2	1&3	
1.2		RT/UT	Critical	NDE	As per Spec			NDE Report	✓	2	2	1&3	Note 5
1.4	TRIM, Ball	Chemical & Mechanical Properties, Impact testing	Major	Chem. & Mech. Analysis	One per Melt / Heat			MTC	✓	2	2	1&3	Note 11
1.5		MPI/LPI	Critical	NDE	As per Spec			NDE Report	✓	2	2	1&3	
1.7	Accessories Like Gear / Hand Wheel	Chemical & Mechanical Properties	Major	Chem. & Mech. Analysis	One per Melt / Heat			MTC	✓	2	2	1&3	
1.8		Make, Model & Operation	Major	Visual & Functional	100%			TC	✓	2	2	1&3	
1.11	FLANGES, GASKETS#	Chemical & Mechanical Properties, Impact testing of flanges	Major	Chem. & Mech. Analysis	One per Melt / Heat			MTC	✓	2	2	1&3	# if applicable
1.12		Dimensions, Rating, Type etc.	Major	Visual	100%			MTC/TC	✓	2	2	1&3	
1.13	FASTENERS	Chemical & Mechanical Properties Proof Load Test, Impact testing	Major	Chem. & Mech. Analysis	One per Melt / Heat	BHEL Spec / Appd Drawing / Appd Datasheet		MTC	✓	2	2	1&3	

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL/BHEL NOMINATED INSPECTION AGENCY 2 FOR VENDOR/SUB VENDOR & 3 FOR END USER AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. * FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.	PREPARED BY VENDOR'S SIGNATURE & STAMP	APPROVED BY BHEL QA SIGNATURE & STAMP	APPROVED BY CUSTOMER'S SIGNATURE & STAMP

VENDOR'S NAME & ADDRESS:	**TYPICAL MANUFACTURING QUALITY PLAN**		QP. NO.:	
	CUSTOMER: BHEL, HYDERABAD – 32. PROJECT: PRODUCT:BALL VALVE	BHEL P.O.NO.: P.O. DATE: BHEL SPEC: REV:	REV NO:	DATE:
			PAGE2 OF3	

SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY P	AGENCY W	AGENCY V	REMARKS
2.0	**INPROCESS INSPECTION**												
2.1	BALL VALVE	LPT on Seating Surfaces, Spindle and Butt Welding Ends of Valves	Major	LPT	100%	BHEL Spec / Appd Drawing / Appd Datasheet		ITR	✓	2	2	1&3	
2.2		Visual, Dimensions	Major	Visual, Measurement	100%			IR	✓	2	2	1&3	
3.0	**FINAL INSPECTION & TESTING**												
3.1	BALL VALVE	Visual, Dimensions, BOM	Major	Visual, Measurement	100%	ANSI B 16.10 & B 16.5, 125 AARH / BHEL Spec / Appd Drawing / Appd Datasheet		IR	✓	2	1&3		10% witness by 1&3
3.2		Hydro Test on Body, Seat	Major	Hydro test	100%	BS EN 12266 Pt 1, 2 / BHEL Spec / Appd Drawing / Appd Datasheet		IR	✓	2	1&3		10% witness by 1&3
3.3		Air Test on Seat	Major	Leak Test	100%			IR	✓	2	1&3		10% witness by 1&3
3.4		PMI – all accessible areas	Major	NDE	100%	BHEL Spec / Appd Drawing / Appd Datasheet / IBR		ITR	✓	2	1&3		Note 7 random witness by 1&3
3.5	BALL VALVE	Galvanization# (Uniformity, Thickness of Coating) – for GI valves	Major	Measurement	100%	BHEL Spec / Appd Drawing / Appd Datasheet / IBR		TC/ITR	✓	2	-	1&3	
3.6		IBR Certificate (as applicable)	Critical	Doc. Verification	100%			IBR Certificate	✓	2	-	1&3	# if applicable
3.7		Name Plate Check	Critical	Visual	100%			IR	✓	2	1&3		

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VENDOR'S NAME & ADDRESS:	**TYPICAL MANUFACTURING QUALITY PLAN**		QP. NO.:	
	CUSTOMER: BHEL, HYDERABAD – 32. PROJECT: PRODUCT:BALL VALVE	BHEL P.O.NO.: P.O. DATE: BHEL SPEC: REV:	REV NO:	DATE:
			PAGE3 OF3	

SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	* D	AGENCY P	AGENCY W	AGENCY V	REMARKS
3.8	SPARES FOR VALVE	BOM & TC	Major	Visual & TC review	100%			TC	✓	2	1&3		
4.0	**PRESERVATION & PACKING**												
4.1	BALL VALVE	Surface Preparation	Critical	Visual	100%	Blast cleaning to SA 2 1/2 or SSPC-SP-10 or NACE #2	BHEL Spec / Appd Datasheet	IR	✓	2	-	1&3	
4.2		Painting (Shade, DFT)	Major	Visual, Measurement	Random	BHEL Spec / Appd Drawing / Appd Datasheet		IR	✓	2	-	1&3	
4.3		Markings & End protection	Major	Visual	100%			IR	✓	2	-	1&3	Note 9
4.4		Preservation	Major	Visual	100%			IR	✓	2	-	1&3	Note 8
4.5		Packing	Major	Visual	100%			Packing List	✓	2	2	-	

Notes: -

1. This typical MQP should be read along with specification (Latest revision as per PO), approved drawings & approved datasheet (as applicable).
2. Drawing/datasheet shall prevail over quality plan for contradiction if any.
3. All type test reports submitted shall not be older than 5 years from the date of purchase order.
4. Any project/customer specific requirements which shall be notified have to be fulfilled by the vendor at the time of execution of order.
5. Radiography Test (min 2 shots) for Castings as per ASME B16.34 and Ultrasonic Test for Forgings as per ASME B 16.34
6. IGC test as per ASTM A262 Practice B(Castings) / E and Microscopic Structure Examination at 250X Magnification. Photograph of microscopic structure shall be submitted.
7. PMI test witness for SS & Alloy Steel material to establish composition at all accessible areas.
8. CS Valves: A suitable temporary rust preventive with minimum life of one year shall be applied inside the valve body in order to prevent corrosion. SS Valves: Pickling and passivation shall be as per ASTM A380.
9. Markings & End protection shall be as per cl no. 11 & 13 of BHEL Specification.
10. **NACE requirement**: For items coming under **NACE category**, all tests, reports, MTC and certificates shall be submitted as per NACE MR0103 requirements
11. **a)** Ball shall be **solid.**

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL/BHEL NOMINATED INSPECTION AGENCY 2 FOR VENDOR/SUB VENDOR & 3 FOR END USER AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. * FOR ITEMS MARKED ✓ (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.	PREPARED BY VENDOR'S SIGNATURE & STAMP	APPROVED BY BHEL QA SIGNATURE & STAMP	APPROVED BY CUSTOMER'S SIGNATURE & STAMP

SL NO	COMPONENTS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	*	AGENCY			REMARKS
									D	P	W	V	

b) Casting for stem is not allowed.

12. Fire Safe Test certificate shall have same MOC as mentioned in approved Drawing.
13. All lab reports shall be from NABL accredited lab.

Abbreviations: -

MTC	–	Material Test certificate	TC	–	Test Certificate
IR	-	Inspection Report	ITR	-	Internal Test Report
NDE	-	Non Destructive Examination	IGC	-	Inter Granular Corrosion
LPT	-	Liquid Penetrant Test	IBR	-	Indian Boiler Regulations
DFT	-	Dry Film Thickness			

PROJECT ENGINEERING & SYSTEMS DIVISION
RC PURAM, HYDERABAD.
QUALITY & BUSINESS EXELLENCE

INSPECTION / TC REVIEW FORMAT

1	Vendor's Name:		5	Applicable BHEL Spec No:	
2	Project:		6	Approved Drawing No:	
3	PO No:		7	Approved Data Sheet No:	
4	Item Description:		8	Approved QAP No:	

OFFER LIST

S.No	BBU/ PO Sr. No.	Item Description	Total Qty as per PO/BBU	Qty. already accepted	Qty offered for TC review	Cumulative Qty	Balance Qty
A							
B							
C							
D							

TC REVIEW REQUISITION

BBU / PO Sr. No.	QAP Clause No.	Format of Record	Certificate No. & Date	Page No.	REMARKS
A. Item Description:					
B. Item Description:					
C. Item Description:					
D. Item Description:					
E. Item Description:					

SUPPLIER / VENDOR SIGNATURE WITH SEAL	BHEL/ BHEL's TPIA SIGNATURE WITH SEAL
Dt:	**Dt:**