

# **FRAMEWORK AGREEMENT**

## **TECHNICAL SPECIFICATION FOR BALL VALVES**

**SPECIFICATION No. PE-TS-020-100-M004**  
ISSUE NO. 01  
REV NO. 00




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

	<b>TECHNICAL SPECIFICATION BALL VALVES FRAMEWORK AGREEMENT</b>	PE-TS-020-100-M004
		Issue No: 01
		Rev. No. 00
		Date : 03.03.2025


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## PROJECT INFORMATION


SL.NO	DESCRIPTION	DETAILS
1	<b>CUSTOMER</b>	DETAILS SHALL BE INFORMED DURING PROJECT SPECIFIC PO PLACEMENT
2	<b>CUSTOMER CONSULTANT</b>	
3	<b>LOCATION</b>	
3.1	COORDINATES	
3.2	NEAREST RAILWAY STATION	
3.3	NEAREST SEA PORT	
3.4	NEAREST AIRPORT	
3.5	NEAREST NATIONAL HIGHWAY	
4	<b>METEOROLOGICAL DATA</b>	
4.1	MAXIMUM TEMPERATURE	
4.2	MINIMUM TEMPERATURE	
4.3	RELATIVE HUMIDITY (FOR DESIGN)	
4.4	AVERAGE ANNUAL RAINFALL	
4.5	SEISMIC ZONE (AS PER IS 1893)	
4.6	HEIGHT ABOVE MSL	
5	<b>ELECTRICAL DATA</b>	
5.1	AMBIENT TEMPERATURE FOR DESIGN OF ELECTRICAL EQUIPMENT	
5.2	RATED FREQUENCY	
5.3	FREQUENCY VARIATION	
5.4	AC VOLTAGE	
5.5	AC VOLTAGE VARIATION	
5.6	DC VOLTAGE	
5.7	DC VOLTAGE VARIATION	
5.8	FAULT LEVEL (KA/SEC)	


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## SCOPE


### SCOPE OF THIS PACKAGE COVERS THE FOLLOWING:

SL.NO	PARAMETERS	REQUIREMENT
1	Supply Including Design, Engineering, Manufacturing of	YES
a)	Main Supply	YES
b)	Commissioning Spares	YES
2	Painting	NO
3	Inspection & Testing	YES
4	Packing	YES
5	Transportation & Delivery To Site	YES
6	Erection & Commissioning	NO
7	Supervision of Erection & Commissioning	NO
8	Performance Guarantee (PG) Test	NO
9	Mandatory Spares	YES
10	O & M Service	NO
11	O & M Spares	NO


	<p align="center"><b>TECHNICAL SPECIFICATION BALL VALVES FRAMEWORK AGREEMENT</b></p>		<p>PE-TS-020-100-M004</p> <p>Issue No: 01</p> <p>Rev. No. 00</p> <p>Date : 03.03.2025</p>
	<p align="center"><b>GENERAL TECHNICAL REQUIREMENT</b></p>		
1.0	<p>Bidder shall also ensure that the offered valves shall comply with all applicable statutory and regulatory requirements.</p>		
2.0	<p>In the event of any conflict between the requirements of two clauses of this specification, documents or requirements of different codes and standards specified, the more stringent requirement as per the interpretation of the BHEL shall apply.</p>		
3.0	<p>Drawing/document submission shall be through web based Document Management System(DMS) of BHEL. Bidder would be provided access to the DMS for drawing/document submission. Bidder to ensure internet connectivity of min speed of 2Mbps at their end.</p>		
4.0	<p>Drawings/ documents submitted by supplier at any stage shall be complete in all respects. Any incomplete drawing submitted shall be treated as non- submission with delays attributable to supplier.</p>		
5.0	<p>Latest codes and standards shall be applicable as on date of techno-commercial bid opening.</p>		
6.0	<p>Valves with socket welded and butt welded ends shall have extended pieces.</p>		
7.0	<p>Gear box POD Test:</p>		
a.	<p>Gear box POD test shall be done as per the procedure described below or as per the procedure agreed between BHEL/Customer &amp; vendor. In case, the Gear box POD test has been done earlier, Test report/certificate of POD test for identical model/ type/rating of gear box is required to be submitted for review by BHEL/customer. These tests should have been conducted at an independent laboratory or should have been witnessed by reputed customers like NTPC etc. or third party inspection agency like LLOYDS, TUV, DNV etc. If found satisfactory, Gear Box POD test need not be done.</p> <p>Gear box POD Test shall be carried out only at full rated torque of gear box, throughout the full cycle of testing i.e. at no point during each full cycle of testing; the applied torque should be less than the full rated torque of Gear Box. Refer suggestive Fig.1 below for Gear Box POD test set up. Dead weight and length of arm shall be so selected that the torque generated at point "C" and "B" shall in no case be less than the full rated torque of the gear box.</p> <div data-bbox="652 1475 1250 1844" data-label="Diagram"> </div> <p align="center"><b>TEST SET UP</b></p> <p align="center">FIG. 1</p>		
b.	<p>Gear box POD test, if required, then the charges for the same shall deemed to be included in the unit quoted prices of main valves. Bidder shall not indicate these charges as a separate head in the price bids. If POD test for gear box are required to be carried out, then the vendor shall do so at his own cost. No extra charge on this account will be admissible to the vendors.</p>		
8.0	<p>The minimum NDT/testing and inspection requirements for valve shall be as per the Quality Plan. However, in case of order, final inspection and testing shall be carried out as per the final approved quality plan without any price implications.</p>		

		PE-TS-020-100-M004
TECHNICAL SPECIFICATION BALL VALVES FRAMEWORK AGREEMENT		Issue No: 01
		Rev. No. 00
		Date : 03.03.2025
	TECHNICAL DATA (STAINLESS STEEL BODY SS316L/CF8M)	
1.0	DESIGN CODES & STANDARDS	
1.1	Codes and Standards	BS EN ISO 17292 (Design & Testing)
1.2	End Connections for valves upto 50NB	IS 554/ Female Parallel
1.3	End Connections for valves above 50NB	ANSI B16.5/ Raised Face
2.0	MATERIAL OF CONSTRUCTION	
	For valves upto 50NB	
2.1	Body	Forged Stainless Steel as per SS 316L
2.2	End piece	Forged Stainless Steel as per SS 316L
2.3	Ball	Stainless Steel as per AISI 316L (Ball mirror finish)
2.4	Stem	Stainless Steel as per AISI 316L
2.5	Gland	Stainless Steel as per AISI 316L
	For valves above 50NB	
2.6	Body	Cast Stainless Steel as per ASTM A 351 CF8M
2.7	End piece	Cast Stainless Steel as per ASTM A 351 CF8M
2.8	Ball	Stainless Steel as per AISI 316 (Ball mirror finish)
2.9	Stem	Stainless Steel as per AISI 316
2.10	Gland	Stainless Steel as per AISI 316
	For all valve sizes	
2.11	Seat ring	Virgin unfilled oil free PTFE (Non-asbestos type)
2.12	Body seal	Virgin unfilled oil free PTFE (Non-asbestos type)
2.13	Stem seal	Virgin unfilled oil free PTFE (Non-asbestos type)
2.14	Gland packing	Virgin unfilled oil free PTFE (Non-asbestos type)
2.15	Body stud	AISI 316
2.16	Body nut	AISI 316
2.17	Gland nut	AISI 316
2.18	Lever	AISI 316 with plastic sleeve grip
2.19	Lever adopter	AISI 316
2.20	Stem washers	Spring steel
2.21	Stopper pin	AISI 316
2.22	Name plate (for valve tag no.)	SS 316 (minimum 2 mm thick)
3.0	CONSTRUCTION FEATURES	
3.1	Valve Port for valves upto 50NB	Reduced bore
3.2	Valve Port for valves above 50NB	Full bore
3.3	Fire safe	Non fire safe
3.4	Valve design for valves above 50NB	Short body
3.5	Operation for valves upto 150NB	Manual

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	TECHNICAL DATA (STAINLESS STEEL BODY SS304/CF8M)		
1.0	DESIGN CODES & STANDARDS		
1.1	Codes and Standards	BS EN ISO 17292 (Design & Testing)	
1.2	End Connections for valves upto 50NB	IS 554/ Female Parallel	
1.3	End Connections for valves above 50NB	ANSI B16.5/ Raised Face	
2.0	MATERIAL OF CONSTRUCTION		
	For valves upto 50NB		
2.1	Body	Forged Stainless Steel as per SS 304	
2.2	End piece	Forged Stainless Steel as per SS 304	
	For valves above 50NB		
2.3	Body	Cast Stainless Steel as per ASTM A 351 CF8M	
2.4	End piece	Cast Stainless Steel as per ASTM A 351 CF8M	
	For all valve sizes		
2.5	Ball	Stainless Steel as per AISI 316 (Ball mirror finish)	
2.6	Stem	Stainless Steel as per AISI 316	
2.7	Gland	Stainless Steel as per AISI 316	
2.8	Seat ring	Virgin unfilled oil free PTFE (Non-asbestos type)	
2.9	Body seal	Virgin unfilled oil free PTFE (Non-asbestos type)	
2.10	Stem seal	Virgin unfilled oil free PTFE (Non-asbestos type)	
2.11	Gland packing	Virgin unfilled oil free PTFE (Non-asbestos type)	
2.12	Body stud	AISI 316	
2.13	Body nut	AISI 316	
2.14	Gland nut	AISI 316	
2.15	Lever	AISI 316 with plastic sleeve grip	
2.16	Lever adopter	AISI 316	
2.17	Stem washers	Spring steel	
2.18	Stopper pin	AISI 316	
2.19	Name plate (for valve tag no.)	SS 316 (minimum 2 mm thick)	
3.0	CONSTRUCTION FEATURES		
3.1	Valve Port for valves upto 50NB	Reduced bore	
3.2	Valve Port for valves above 50NB	Full bore	
3.3	Fire safe	Non fire safe	
3.4	Valve design for valves above 50NB	Short body	
3.5	Operation for valves upto 150NB	Manual	

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	TECHNICAL DATA (CARBON STEEL BODY A105/WCB)		
1.0	DESIGN CODES & STANDARDS		
1.1	Codes and Standards	BS EN ISO 17292 (Design & Testing)	
1.2	End Connections for valves upto 50NB	IS 554/ Female Parallel	
1.3	End Connections for valves above 50NB	ANSI B16.5/ Raised Face	
1.4	Hot Dip Galvanising	IS 2629	
2.0	MATERIAL OF CONSTRUCTION		
	For valves upto 50NB		
2.1	Body	Forged Carbon Steel as per ASTM A 105 (Hot Dip Galvanised)	
2.2	End piece	Forged Carbon Steel as per ASTM A 105 (Hot Dip Galvanised)	
	For valves above 50NB		
2.3	Body	Cast Carbon Steel as per ASTM A 216 Gr. WCB (Hot Dip Galvanised)	
2.4	End piece	Cast Carbon Steel as per ASTM A 216 Gr. WCB (Hot Dip Galvanised)	
	For all valve sizes		
2.5	Ball	Stainless Steel as per AISI 316 (Ball mirror finish)	
2.6	Stem	Stainless Steel as per AISI 316	
2.7	Gland	Stainless Steel as per AISI 316	
2.8	Seat ring	Virgin unfilled oil free PTFE (Non-asbestos type)	
2.9	Body seal	Virgin unfilled oil free PTFE (Non-asbestos type)	
2.10	Stem seal	Virgin unfilled oil free PTFE (Non-asbestos type)	
2.11	Gland packing	Virgin unfilled oil free PTFE (Non-asbestos type)	
2.12	Body stud	AISI 316	
2.13	Body nut	AISI 316	
2.14	Gland nut	AISI 316	
2.15	Lever	Carbon Steel (Hot Dip Galvanised) with plastic sleeve grip	
2.16	Lever adopter	Carbon Steel (Hot Dip Galvanised)	
2.17	Stem washers	Spring steel	
2.18	Stopper pin	AISI 316	
2.19	Name plate (for valve tag no.)	SS 316 (minimum 2 mm thick)	
2.20	Gear box	Applicable	
2.20a	Main Housing/ Cover (Totally enclosed construction)	Cast Iron IS:210 Gr. FG 220/260	
2.20b	Input shaft	13% Cr SS/ EN8 ( ~200 BN)	
2.20c	Worm	EN8 (~200 BN)	
2.20d	Worm wheel	Ductile Iron/ S.G. Iron	
2.20e	Hand wheel	Malleable Iron	
3.0	CONSTRUCTION FEATURES		
3.1	Valve Port for valves upto 50NB	Reduced bore	
3.2	Valve Port for valves above 50NB	Full bore	
3.3	Fire safe	Non fire safe	
3.4	Valve design for valves above 50NB	Short body	
3.5	Operation for valves upto 150NB	Manual	
3.5	Operation for valves above 150NB	Gear operated	
3.6	Body, End piece, Lever and Lever Adopter	Hot Dip Galvanised	
3.7	Minimum thickness of Galvanising	50 Micron	



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	TECHNICAL DATA (GUN METAL BODY LTB2)		
1.0	DESIGN CODES & STANDARDS		
1.1	Codes and Standards	BS EN ISO 17292 (Design & Testing)	
1.2	End Connections	IS 554/ Female Parallel	
1.3	Hot Dip Galvanising	IS 2629	
2.0	MATERIAL OF CONSTRUCTION		
2.1	Body	Gun Metal as per IS:318 Gr. LTB2	
2.2	End	Gun Metal as per IS:318 Gr. LTB2	
2.3	Ball	Gun Metal as per IS:318 Gr. LTB2	
2.4	Stem	IS:320 HT2	
2.5	Gland	Gun Metal as per IS:318 Gr. LTB2	
2.6	Seat ring	Virgin unfilled oil free PTFE (Non-asbestos type)	
2.7	Body seal	Virgin unfilled oil free PTFE (Non-asbestos type)	
2.8	Stem seal	Virgin unfilled oil free PTFE (Non-asbestos type)	
2.9	Gland packing	Virgin unfilled oil free PTFE (Non-asbestos type)	
2.10	Body stud	AISI 316	
2.11	Body nut	AISI 316	
2.12	Gland nut	AISI 316	
2.13	Lever	Carbon Steel (Hot Dip Galvanised) with plastic sleeve grip	
2.14	Lever adopter	Carbon Steel (Hot Dip Galvanised)	
2.15	Stem washers	Spring steel	
2.16	Stopper pin	AISI 316	
2.17	Name plate (for valve tag no.)	SS 316 (minimum 2 mm thick)	
3.0	CONSTRUCTION FEATURES		
3.1	Valve Port for valves upto 50NB	Reduced bore	
3.2	Fire safe	Non fire safe	
3.4	Operation for valves upto 150NB	Manual	
3.5	Lever and Lever Adopter	Hot Dip Galvanised	
3.6	Minimum thickness of Galvanising	50 Micron	



TECHNICAL SPECIFICATION  
BALL VALVES  
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## QUALITY PLAN

	MANUFACTURER/BIDDER/ SUPPLIER NAME & ADDRESS		QUALITY PLAN						SPEC. NO.: PE-TS-020-100-M004			DATE: 03.03.2025		
			CUSTOMER.: LATER						QP NO.: PE-QP-020-100-M051			DATE: 03.03.2025		
			PROJECT.: FRAMEWORK AGREEMENT						PO NO.: LATER			DATE:		
			ITEM: BALL VALVES			SYSTEM: SERVICE & INST. AIR LINE			SECTION: II			PAGE 1 OF 3		
SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS		
1	2	3	4	5	6	7	8	9	10			11		
					M B/C				D	M	B	C		

### 1.0 RAW MATERIALS INSPECTION

1.1	Body, End Pieces, Ball, Spindle, Gland, Lever, Fasteners	Mechanical Properties & Chemical Composition	MA	Mech., Chemical Tests	One/ Heat	---	Appd. Drg./ Material Std.	Appd. Drg. / Material Std.	MTC	√	V	V	-	Body & End Pieces should carry Heat Marks for co-relation with Mill Test Certificates
		Heat Treatment	MA	Review of H.T. Records	100%	---	Appd. Drg. / Material Std.	Appd. Drg. / Material Std.	H.T. Internal Inspn. Records	√	P	V	-	
		UT (On Bar Stock for Stem) #	MA	NDT	100%	---	ASTMA 388	ASME B16.34	IR	√	P	V	-	#: If Bar Dia. ≥ 40mm
		Casting Defects	MA	Visual	100%	---	MSS-SP-55	Free from Defects	IR	√	P	V	-	
		Surface Defects	CR	LPT ##	100%	---	ASTM E165	ASME B16.34	NDT Report	√	P	V	-	##: For SS Valves only

### 2.0 IN-PROCESS INSPECTION

2.1	All Components (After Machining)	Dimensions	MA	Measurement	100%	---	Mfg. Drg.	Mfg. Drg.	Log Book	-	P	V	-	
		Hardness (For Ball and Spindle)	MA	Hardness Testing	100%	---	Appd. Drg./ Material Std.	Appd. Drg./ Material Std.	TC	√	P	V	-	
		Surface Defects	CR	LPT	100%	---	ASTM E 165	ANSI B16.34	NDT Report	√	P	V	-	For Ball, Spindle Seats & Machined Surfaces


### 3.0 GEAR BOX

3.1	Gear Box	Make and Model	MA	Visual	100%	---	Manufacturer Catalogue/Drawing		IR	-	P	V	V	
3.2	Gear, Worm Gear & Shaft	Physical, Chemical Props.	MA	Phys., Chem. Tests	One/ Batch	---	Rel. Std./ Data Sheet/ Mfg. Drg.	Rel. Std./ Data Sheet/ Mfg. Drg.	IR	√	P	V	V	
		Hardness	MA	Measurement	100%	---	Rel. Std./ Data Sheet/ Mfg. Drg.	Rel. Std./ Data Sheet/ Mfg. Drg.	IR	√	P	V	V	
3.3	Gear Box Assembly	Performance	MA	Operation Test	100%	---	Drg./Data Sheet	Drg./Data Sheet	Supplier TC	√	P	V	V	
		Dimensions	MA	Measurement	100%	---	Rel Std./ Data Sheet/ Mfg. Drg.	Rel Std./ Data Sheet/ Mfg. Drg.	IR	√	P	V	V	
3.4	Design Verification of Gear Box	Torque Capability	MA	Testing (Torque at Twice the Rated Torque of Gear Box)	One/ Type/ Model/ Rated Torque	---	Approved Procedure	Approved Procedure	TC	√	P	V	V	Refer Note '3'
	Type Test	Gear Box P.O.D. (Life Cycle Test)	MA	Cycle Testing		---	Approved Procedure	Approved Procedure	TC	√	P	V	V	Refer Note '3'

BIDDER/SUPPLIER	
Sign & Date	
Seal	

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Checked by:	RAHUL KADAM	<small>Digitally signed by RAHUL KADAM DN: cn=RAHUL KADAM, o=BHEL, ou=PEM, email=rahulkadam@bhel.in, c=IN Date: 2025.03.03 10:44:52 +05'30'</small>	Checked by:	Ashish Panigrahi	<small>Digitally signed by Ashish Panigrahi DN: cn=Ashish Panigrahi, o=BHEL, ou=PS- PEM, email=ashishpanigrahi@bhel.in, c=IN Date: 2025.03.03 15:12:34 +05'30'</small>
Reviewed by:	Kuldeep Kumar	<small>Digitally signed by Kuldeep Kumar DN: cn=Kuldeep Kumar, o=BHEL, ou=PEM, email=kuldeepkumar@bhel.in, c=IN Date: 2025.03.03 14:33:14 +05'30'</small>	Reviewed by:	HARISH KUMAR	<small>Digitally signed by HARISH KUMAR DN: cn=HARISH KUMAR, o=BHEL, ou=PEM, email=harishkumar@bhel.in, c=IN Date: 2025.03.03 14:33:14 +05'30'</small>

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			


	MANUFACTURER/BIDDER/ SUPPLIER NAME & ADDRESS		QUALITY PLAN						SPEC. NO.: PE-TS-020-100-M004			DATE: 03.03.2025		
			CUSTOMER.: LATER						QP NO.: PE-QP-020-100-M051			DATE: 03.03.2025		
			PROJECT.: FRAMEWORK AGREEMENT						PO NO.: LATER			DATE:		
			ITEM: BALL VALVES			SYSTEM: SERVICE & INST. AIR LINE			SECTION: II			PAGE 2 OF 3		
SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	D	10			11
					M	B/C					M	B	C	

4.0 TESTING														
4.1	Body	Leak Tightness	CR	Hydraulic Test	100%	Refer Note '1'	Appd. Drg.	No Leakage	TR	√	P	W	W	Before Galvanization
4.2	Seat	Leak Tightness	CR	Hydraulic Test	100%		Appd. Drg.	No Leakage	TR	√	P	W	W	
		Leak Tightness	CR	Pneumatic Test	100%		Appd. Drg.	No Leakage	TR	√	P	W	W	
4.3	Operational Testing	Full Opening & Closing of Valve	MA	Operation	100%	Refer Note '1'	ASME B16.34	Smooth Operation of Valve	IR	√	P	W	W	
			MA	Torque Testing S	100%		Torque Calculations	Torque Within Calculated Value	TR	√	P	W	W	\$: For Gear Operated Valves
4.4	Hot Dip Galvanization of Body, End Pieces and All Other Valve Parts  (Applicable for CS Material Only)	Surface Preparation, Thickness of Galvanization & Uniformity	MA	Visual & Measurement	100%		IS:2629	IS:2629 \$\$	IR	√	P	W	V	\$\$: Minimum Thickness of Galvanization shall Be <b>50 Microns</b> , To Be Checked with Elcometer
		Adhesion	MA	Knife Test	100%	IS:2629	IS:2629	IR	√	P	W	V		
4.5	Ball and Seat	Mirror Finish (Ball)	CR	Buffing/ Grinding/ Machining	100%	---	The surface shall be smooth and shall have uniform contact with soft seat		Log Book	-	P	V	V	
5.0 FINAL INSPECTION														
5.1	Complete Valves	End Connection & Overall Dimensions, Threading (of GM Valves), Fixing of Nameplate with Valve Tag Nos. & Arrow Marking	CR	Measurement, Visual	100%	Refer Note '1'	Appd. Drg.	Appd. Drg.	IR	√	P	W	W	
5.2	Packing	Packing Soundness	MA	Visual	100%	---	Appd. Drg.	Appd. Drg.	IR	√	P	V	-	

BIDDER/SUPPLIER	
Sign & Date	
Seal	

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Checked by:	RAHUL KADAM	<small>Digitally signed by RAHUL KADAM DN: cn=RAHUL KADAM, o=BHEL, ou=PEM, email=rahulkadam@bhel.in, c=IN Date: 2025.03.03 10:45:18 +05'30'</small>	Checked by:	Ashish Panigrahi	<small>Digitally signed by Ashish Panigrahi DN: cn=Ashish Panigrahi, o=BHEL, ou=PS- PEM, email=ashishp@bhel.in, c=IN Date: 2025.03.03 15:12:58 +05'30'</small>
Reviewed by:	Kuldeep Kumar	<small>Digitally signed by Kuldeep Kumar DN: cn=Kuldeep Kumar, o=BHEL, ou=PEM, email=Kuldeep.kumar@bhel.in, c=IN Date: 2025.03.03 14:32:47 +05'30'</small>	Reviewed by:	HARISH KUMAR	<small>Digitally signed by HARISH KUMAR DN: cn=harishkumar, o=BHEL, ou=PEM, email=harish_kumar@bhel.in, c=IN Date: 2025.03.03 10:36:03 +05'30'</small>

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

	MANUFACTURER/BIDDER/ SUPPLIER NAME & ADDRESS		QUALITY PLAN					SPEC. NO.: PE-TS-020-100-M004		DATE: 03.03.2025
			CUSTOMER.: LATER					QP NO.: PE-QP-020-100-M051		DATE: 03.03.2025
			PROJECT.: FRAMEWORK AGREEMENT					PO NO.: LATER		DATE:
			ITEM: BALL VALVES			SYSTEM: SERVICE & INST. AIR LINE		SECTION: II		PAGE 3 OF 3
SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS
1	2	3	4	5	6	7	8	9	10	11
					M B/C			D	M B C	

**NOTES:**

- 10% or min. 2 nos. at random, whichever is higher, by BHEL/Customer for each type, size & rating.
- Welding and Impregnation of casting are not permitted.
- Review/ verification of test report/certificate, in case these tests have been carried out earlier on the identical model/type/rating of gear box, at an independent laboratory or witnessed by reputed customer like NTPC etc. or third-party inspection agency like LLOYDS, TUV, DNV etc. If the above test reports/certificates are not available or not found satisfactory by BHEL/customer, then the required type tests to be carried out by the vendor on gear box without any commercial implications at his own cost & witnessed by BHEL/customer.

**Legends:**

**D:** Documentation; Records identified with "Tick"(✓), shall be essentially included by supplier in QA Documentation  
**M:** Supplier/ Manufacturer/ Sub-Supplier  
**B:** Main Supplier/BHEL/ Third Party Inspection agency  
**C:** Customer  
**TPIA:** Third Party Inspection Agency  
**DFT:** Dry Film Thickness

**MA:** Major Characteristic  
**CR:** Critical Characteristic  
**TC:** Test Certificate  
**TR:** Test Report  
**MTC:** Mill Test Certificate


**P:** Perform  
**W:** Witness  
**V:** Verification  
**IR:** Inspection Report  
**ADS:** Actuator Data Sheet

**HT:** Heat Treatment  
**LPT:** Liquid Penetrant Test  
**UT:** Ultrasonic Test  
**RT:** Radiography Test  
**MPI:** Magnetic Particle Inspection

BIDDER/SUPPLIER	
Sign & Date	
Seal	

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Checked by:	RAHUL KADAM	<small>Digitally signed by RAHUL KADAM DN: cn=RAHUL KADAM, o=BHEL, ou=PEM, email=rahulkadam@bhel.in, c=IN Date: 2025.03.03 10:45:43 +05'30'</small>	Checked by:	Ashish Panigrahi	<small>Digitally signed by Ashish Panigrahi DN: cn=Ashish Panigrahi, o=BHEL, ou=PS-PEM, email=ashishp@bhel.in, c=IN Date: 2025.03.03 15:13:15 +05'30'</small>
Reviewed by:	Kuldeep Kumar	<small>Digitally signed by Kuldeep Kumar DN: cn=Kuldeep Kumar, o=BHEL, ou=PEM, email=Kuldeep.Kumar@bhel.in, c=IN Date: 2025.03.03 14:33:40 +05'30'</small>	Reviewed by:	HARISH KUMAR	<small>Digitally signed by HARISH KUMAR DN: cn=HARISH KUMAR, o=BHEL, ou=PEM, email=harish_kumar@bhel.in, c=IN Date: 2025.03.03 15:38:21 +05'30'</small>

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

	TECHNICAL SPECIFICATION BALL VALVES FRAMEWORK AGREEMENT	PE-TS-020-100-M004
		Issue No: 01
		Rev. No. 00
		Date : 03.03.2025

## PAINTING REQUIREMENT

Package	Condition	Surface Preparation	Primer Coat	No. of Coats	DFT (in Microns)	Intermediate Coat (in Microns)	No. of Coats	DFT (in Microns)	Final Coat	No. of Coats	DFT (in Microns)	Total DFT
NOT APPLICABLE												

	<p>TECHNICAL SPECIFICATION BALL VALVES FRAMEWORK AGREEMENT</p>	PE-TS-020-100-M004
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## PACKING REQUIREMENT

SL. No.	DESCRIPTION
<b>1</b>	<b>Type of Packing:</b>
1.1	The valve shall be dispatched in total assembled form.
1.2	Body ends shall be suitably sealed to protect them against damage during transit and storage.
1.3	Valves with screwed and socket welding ends shall be protected by means of polythene caps/ rubber and protectors to prevent damage of ends & also to avoid foreign material entering the valve while shipment & storage.
1.4	A thin sheet steel circular blanking plate of a diameter 6mm less than the bolt holes inner P.C.D. shall be firmly fixed to the flange faces by the application of adhesive after first ensuring that the flanges faces have been thoroughly degreased. A thin coat of adhesive shall be applied to the flange face and the blanking plate and then allowed to dry for 15-20 minutes. The coated face of the blanking plate should then be offered up 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 plate and flange. A wooden blank should then be bolted to the flange using a minimum of 4 bolts.
1.5	All the valves shall be packed suitably in wooden box in order to avoid damage during transit and also during storage at site.
<b>2</b>	<b>Cushioning material and moisture absorber:</b>
2.1	Suitable cushioning shall be provided by rubberized coir/ thermocol / expanded soft polyethylene foam.
2.2	Adequate quantity of packed desiccant shall be suitably placed inside the packing box.
<b>3</b>	<b>Packing slip &amp; holder:</b>
3.1	Packing slip kept in polyethylene bag shall be placed inside the wooden box at appropriate place.
3.2	One copy of packing slip wrapped in polyethylene bag covered in galvanized iron tin sheet/ aluminium packing slip holder shall be fixed on the external surface the packing box.


	TECHNICAL SPECIFICATION BALL VALVES FRAMEWORK AGREEMENT	PE-TS-020-100-M004
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		Rev. No. 00
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## BILL OF QUANTITY (BOQ)



<div></div>				<div>TECHNICAL SPECIFICATION BALL VALVES FRAMEWORK AGREEMENT</div>										<div>PE-TS-020-100-M004</div> <div>Issue No: 01</div> <div>Rev. No. 00</div> <div>DATE : 03.03.2025</div>						
BILL OF QUANTITY (BOQ)																				
1	2	3	4	5	6		7	8	9	10	11	12	13		14	15			16	
SL. NO.	TAG NO.	TYPE OF VALVE	SIZE mm (NB)	OPERATION	DESIGN		SERVICE	RATING, DESIGN & TESTING CODE	BODY MATERIAL	TRIM MATERIAL	END CONN	SPECIAL FEATURES	MATCHING PIPE OD x THK		MAIN VALVES QTY WITHOUT COMMISSIONING SPARES  Nos.	COMMISSIONING SPARES (SETS)			MANDATORY SPARES (COMPLETE VALVE WITHOUT COMM. SPARES)	
					PRESSURE KG/CM2(G)	TEMP ( DEG ° C)							MM	MM		BODY SEAL	STEM WASHER	STEM SEAL		
1	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	Ball	15	MANUAL	8.4	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL. 800 OF ISO 17292	FORGED STAINLESS STEEL AS PER ASTM A182 F316L	SS 316	SCREWED AS PER IS:554 FEMALE PARALLEL	-	21.8	3.2	1120	112	112	112	56	
2	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	Ball	25	MANUAL	8.4	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL. 800 OF ISO 17292	FORGED STAINLESS STEEL AS PER ASTM A182 F316L	SS 316	SCREWED AS PER IS:554 FEMALE PARALLEL	-	34.2	4.0	924	98	98	98	49	
3	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	Ball	50	MANUAL	8.4	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL. 800 OF ISO 17292	FORGED STAINLESS STEEL AS PER ASTM A182 F316L	SS 316	SCREWED AS PER IS:554 FEMALE PARALLEL	-	60.8	4.5	196	21	21	21	14	
4	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	Ball	15	MANUAL	8.4	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL. 800 OF ISO 17292	FORGED STAINLESS STEEL AS PER ASTM A182 F304	SS 316	SOCKET WELDED AS PER ASME B 16.11	EXTENDED PIECE ON BOTH SIDES	21.8	3.2	320	32	32	32	16	
5	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	Ball	25	MANUAL	8.4	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL. 800 OF ISO 17292	FORGED STAINLESS STEEL AS PER ASTM A182 F304	SS 316	SOCKET WELDED AS PER ASME B 16.11	EXTENDED PIECE ON BOTH SIDES	34.2	4.0	418	42	42	42	21	
6	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	Ball	50	MANUAL	8.4	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL. 800 OF ISO 17292	FORGED STAINLESS STEEL AS PER ASTM A182 F304	SS 316	SOCKET WELDED AS PER ASME B 16.11	EXTENDED PIECE ON BOTH SIDES	60.8	4.5	60	6	6	6	3	
7	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	Ball	100	MANUAL	8.4	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL.150 OF ISO 17292	CAST STAINLESS STEEL AS PER ASTM A351 CF8M	SS 316	FLANGED AS PER ASME B 16.5 R/F	-	115	5.4	58	16	16	16	16	
8	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	Ball	150	MANUAL	8.4	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL.150 OF ISO 17292	CAST STAINLESS STEEL AS PER ASTM A351 CF8M	SS 316	FLANGED AS PER ASME B 16.5 R/F	-	166.5	5.4	118	23	23	23	19	
9	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	BALL	15	MANUAL	9.6	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL.800 OF ISO 17292	FORGED CARBON STEEL AS PER ASTM A105	SS 316	SCREWED AS PER IS:554 FEMALE PARALLEL	HOT DIP GALVANIZED	21.8	3.2	546	55	55	55	24	



<div></div>				<div>TECHNICAL SPECIFICATION BALL VALVES FRAMEWORK AGREEMENT</div>										PE-TS-020-100-M004							
														Issue No: 01							
														Rev. No. 00							
														DATE : 03.03.2025							
BILL OF QUANTITY (BOQ)																					
1	2	3	4	5	6		7	8	9	10	11	12	13		14	15			16		
SL. NO.	TAG NO.	TYPE OF VALVE	SIZE mm (NB)	OPERATION	DESIGN		SERVICE	RATING, DESIGN & TESTING CODE	BODY MATERIAL	TRIM MATERIAL	END CONN	SPECIAL FEATURES	MATCHING PIPE OD x THK		MAIN VALVES QTY WITHOUT COMMISSIONING SPARES  Nos.	COMMISSIONING SPARES (SETS)			MANDATORY SPARES (COMPLETE VALVE WITHOUT COMM. SPARES)		
					PRESSURE KG/CM2(G)	TEMP ( DEG °C)							MM	MM		BODY SEAL	STEM WASHER	STEM SEAL			
10	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	BALL	25	MANUAL	9.6	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL.800 OF ISO 17292	FORGED CARBON STEEL AS PER ASTM A105	SS 316	SCREWED AS PER IS:554 FEMALE PARALLEL	HOT DIP GALVANIZED	34.2	4.0	664	67	67	67	27		
11	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	BALL	50	MANUAL	9.6	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL.800 OF ISO 17292	FORGED CARBON STEEL AS PER ASTM A105	SS 316	SCREWED AS PER IS:554 FEMALE PARALLEL	HOT DIP GALVANIZED	60.8	4.5	164	18	18	18	9		
12	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	BALL	80	MANUAL	8.5 - 10	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL.150 OF ISO 17292	CAST CARBON STEEL AS PER ASTM A216 Gr. WCB	SS 316	FLANGED AS PER ASME B 16.5 R/F	HOT DIP GALVANIZED	89.5	4.8	12	8	8	8	6		
13	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	BALL	100	MANUAL	8.5 - 10	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL.150 OF ISO 17292	CAST CARBON STEEL AS PER ASTM A216 Gr. WCB	SS 316	FLANGED AS PER ASME B 16.5 R/F	HOT DIP GALVANIZED	115.0	5.4	3	6	6	6	6		
14	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	BALL	150	MANUAL	8.5 - 10	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL.150 OF ISO 17292	CAST CARBON STEEL AS PER ASTM A216 Gr. WCB	SS 316	FLANGED AS PER ASME B 16.5 R/F	HOT DIP GALVANIZED	166.5	5.4	47	14	14	14	12		
15	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	BALL	200	MANUAL	8.5 - 10	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	CL.150 OF ISO 17292	CAST CARBON STEEL AS PER ASTM A216 Gr. WCB	SS 316	FLANGED AS PER ASME B 16.5 R/F	HOT DIP GALVANIZED + GEAR OPERATED	219.1	6.3	235	29	29	29	15		
16	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	BALL	15	MANUAL	8	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	PN 16 AS PER BS EN ISO 17292/ Manufacturer's Std. for GM BALL VALVES	GM AS PER IS 318 Gr.LTB2	GM AS PER IS 318 Gr.LTB2	SCREWED AS PER IS:554 FEMALE PARALLEL	—	21.8	3.2	425	44	44	44	23		
17	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	BALL	25	MANUAL	8	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	PN 16 AS PER BS EN ISO 17292/ Manufacturer's Std. for GM BALL VALVES	GM AS PER IS 318 Gr.LTB2	GM AS PER IS 318 Gr.LTB2	SCREWED AS PER IS:554 FEMALE PARALLEL	—	34.2	4.0	457	47	47	47	23		
18	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	BALL	40	MANUAL	8	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	PN 16 AS PER BS EN ISO 17292/ Manufacturer's Std. for GM BALL VALVES	GM AS PER IS 318 Gr.LTB2	GM AS PER IS 318 Gr.LTB2	SCREWED AS PER IS:554 FEMALE PARALLEL	—	48.8	4.0	4	4	4	4	4		
19	SHALL BE INFORMED DURING PROJECT SPECIFIC PO	BALL	50	MANUAL	8	50	INSTRUMENT AIR & SERVICE AIR SYSTEMS	PN 16 AS PER BS EN ISO 17292/ Manufacturer's Std. for GM BALL VALVES	GM AS PER IS 318 Gr.LTB2	GM AS PER IS 318 Gr.LTB2	SCREWED AS PER IS:554 PARALLEL FEMALE	—	60.8	4.5	95	12	12	12	7		
NOTES:- 1. PRICES OF COMMISSIONING SPARES TO BE QUOTED SEPARATELY BY BIDDER. IT SHALL NOT BE CLUBBED WITH THE UNIT PRICE OF MAIN VALVES.														TOTAL		5866	654	654	654	350	

	<b>TECHNICAL SPECIFICATION BALL VALVES FRAMEWORK AGREEMENT</b>	PE-TS-020-100-M004
		Issue No. 01
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		Date : 03.03.2025

## DOCUMENTATION REQUIREMENT

<b>DRAWINGS &amp; DOCUMENTS TO BE SUBMITTED BY ALL THE BIDDERS ALONG WITH THE BID</b>	
<b>Sl. No.</b>	<b>DOCUMENT TITLE</b>
1	PQR CREDENTIALS
2	COMPLIANCE SHEET (DULY SIGNED & STAMPED)

<b>DRAWINGS &amp; DOCUMENTS TO BE SUBMITTED BY SUCCESSFUL BIDDER AFTER AWARD OF CONTRACT FOR FRAMEWORK AGREEMENT ALONG WITH SUBMISSION SCHEDULE</b> (The below drawings/ documents will be considered as reference documents for different projects PO which will be placed later)		
<b>Sl. No.</b>	<b>DOCUMENT TITLE</b>	<b>SUBMISSION SCHEDULE</b>
1	GA DRAWING	Within 15 days from PO
2	QUALITY PLAN DULY SIGNED & STAMPED	Within 15 days from PO
3	GEAR BOX POD PROCEDURE/CERTIFICATE (200NB & ABOVE SIZE)	Within 15 days from PO

<b>BHEL/Customer comments/approval and SUPPLIER Re-submission schedule after project specific purchase order placement</b>	
Supplier Submission of project specific GA drawing, Quality plan	Within 7 days from project specific PO
BHEL/Customer comments/approval	Within 18 days of SUPPLIER submission.
SUPPLIER Re-submission	Within 5 days of BHEL / Customer comments.

<b>DRAWINGS &amp; DOCUMENTS TO BE SUBMITTED AS FINAL/AS-BUILT DOCUMENT AGAINST PROJECT SPECIFIC PURCHASE ORDER (To be furnished before final project specific billing)</b>	
<b>Sl. No.</b>	<b>DOCUMENT TITLE</b>
1	APPROVED DOCUMENTS
2	O&M MANUAL



TECHNICAL SPECIFICATION  
BALL VALVES  
FRAMEWORK AGREEMENT

PE-TS-020-100-M004

Issue No. 01

Rev. No. 00

Date : 03.03.2025

**COMPLIANCE CERTIFICATE**

1	It is hereby confirmed that the technical specification (Page 1 to 18) has been read and understood. We confirm compliance to the tender specification including any prebid clarification and amendments issued prior to techno-commercial bid opening without any deviation.
2	It is hereby declared that any technical submittals which was not specifically asked by BHEL in NIT shall not to be considered as part of bid and shall not be evaluated by BHEL.

Signature of authorised Representative

Name and Designation :

Name & Address of the Bidder

Date

	TECHNICAL SPECIFICATION BALL VALVES FRAMEWORK AGREEMENT	PE-TS-020-100-M004
		Issue No. 01
		Rev. No. 00
		Date : 03.03.2025

## PRE QUALIFICATION REQUIREMENT (TECHNICAL)

**PRE - QUALIFYING REQUIREMENTS**

DOCUMENT No.: PE-TS-020-000-M059

REVISION No.: 00 DATE: 03.03.2025

SHEET 1 of 3

**Project: FRAMEWORK AGREEMENT****Package: Ball Valves****CRITERIA FOR EVALUATION (TECHNICAL):****1. Technical Pre-Qualifying Requirements:**

1.1 The bidder should have designed, in-house manufactured, tested, inspected and supplied Ball Valves (as mentioned below) for use in a power plant or for similar application.

**Category-A:** Minimum size of 50NB with FCS/FSS/FAS with #800 or Gun metal with #PN 16.0 for use in a power plant or similar application.

**Category-B:** Minimum size of 150NB with CCS/CSS/CAS with min. #150 for use in a power plant or similar application.

*Bidder to fulfill the PQR of both the categories individually.*

1.2 The item(s) mentioned in point 1.1 should have performed successfully for at least one year. To establish meeting this requirement, the bidder shall conform to any one of the following clauses through supporting documents:

- (i) One (1) Performance certificate along with correlated purchase order from End-user having the item(s) performing successfully for at least one (1) year from date of commissioning. The one-year period should have been completed prior to the date of bid submission as defined by BHEL-PEM in NIT.

**Documents Required:**

Performance certificate from End-user (duly signed & dated) specifying that the product is performing successfully for one (1) year from date of commissioning (also to be mentioned in certificate) along with correlated purchase order.

Or

- (ii) One (1) repeat contract from a purchaser (i.e. 2 Nos of Purchase orders from one purchaser). A contract shall be considered as repeat, when the second contract is given by the same purchaser after lapse of minimum one (1) year from date of placement of first executed contract. The contracts should have been placed prior to the date of bid submission as defined by BHEL-PEM in NIT.

**Documents Required:**

- a) Purchase order(s).  
b) Supply details like Material Dispatch Clearance Certificate (MDCC)/ Material Receipt Certificate (MRC)/Lorry receipt (LR)/ Invoice of first executed Purchase order.

**PREPARED BY:****RAHUL KADAM**

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**DESIGNATION:** Dy. MANAGER  
**DEPT.:** PS-PEM/ MPL

**REVIEWED BY:****Kuldeep Kumar**

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**NAME:** KULDEEP KUMAR  
**DESIGNATION:** Sr. MANAGER  
**DEPT.:** PS-PEM/ MPL

**APPROVED BY:****B K Agarwal**

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c=IN  
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	<b>PRE - QUALIFYING REQUIREMENTS</b>	DOCUMENT No.: PE-TS-020-000-M059
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		SHEET 2 of 3

**Note:**

All the documents as mentioned at CLAUSE 1.2(i) & (ii) shall be within 15 years from date of bid submission as defined by BHEL-PEM in NIT.

1.3 In addition to above, bidder/supplier should have the following facilities for maximum size and material of construction *for each category* of Ball Valve as per BHEL requirement as mentioned in BOQ of Technical Specification:

a) Capability of designing and manufacturing of the item(s).

**Documents required:**

Purchase order (s) / Certificate indicating capacity and details of manufacturing facilities

b) In-house testing facilities for carrying out tests as per relevant standards & Quality plan. In case, the in-house testing facilities are not available, then bidder shall furnish undertaking that test(s) will be carried out from govt. approved lab or test house recognized by reputed customers.

**Documents required:**

Details of testing facilities.

1.4 To establish business continuity, bidder is required to submit at least one (1) Purchase order with min. size of ball valve for each category as specified below in last 3 (three) years prior to the date of bid submission as defined by BHEL-PEM in NIT.

**Category-A:** Minimum size of 15NB.

**Category-B:** Minimum size of 65NB.

2. Bidder to also comply with general points mentioned below.

2.1 Offers of the JV companies/ Joint Bidders/ bidders having collaboration/ licensing agreement/ MOU/ Indian subsidiaries shall be evaluated as follows:

- If bidder happens to be an Indian subsidiary of foreign OEM, then the credentials of the foreign OEM can also be considered for meeting PQR.
- If bidder happens to be the Joint Venture Company, then the credentials of any of JV partners can be also considered for meeting PQR.
- If bidder happens to be the having valid collaboration agreement/ MOU/ licensing agreement with some other company, then the credentials of collaborator/ MOU partner/ licensing company can also be considered for meeting PQR.

<b>PREPARED BY:</b> RAHUL KADAM <small>Digitally signed by RAHUL KADAM DN: cn=RAHUL KADAM, o=BHEL, ou=PEM, email=rahulkadam@bhel.in, c=IN Date: 2025.03.03 10:48:37 +05'30'</small> <b>NAME:</b> RAHUL KADAM <b>DESIGNATION:</b> Dy. MANAGER <b>DEPT.:</b> PS-PEM/ MPL	<b>REVIEWED BY:</b> Kuldeep Kumar <small>Digitally signed by Kuldeep Kumar DN: cn=Kuldeep Kumar, o=BHEL, ou=PEM, email=kuldeep.kumar@bhel.in, c=IN Date: 2025.03.03 14:34:52 +05'30'</small> <b>NAME:</b> KULDEEP KUMAR <b>DESIGNATION:</b> Sr. MANAGER <b>DEPT.:</b> PS-PEM/ MPL	<b>APPROVED BY:</b> B K Agarwal <small>Digitally signed by B K Agarwal DN: cn=B K Agarwal, o=BHEL, ou=PEM, email=bimal@bhel.in, c=IN Date: 2025.03.03 15:37:13 +05'30'</small> <b>NAME:</b> B K AGARWAL <b>DESIGNATION:</b> AGM (DH) <b>DEPT.:</b> PS-PEM/ MPL
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	<b>PRE - QUALIFYING REQUIREMENTS</b>	DOCUMENT No.: PE-TS-020-000-M059
		REVISION No.: 00    DATE: 03.03.2025
		SHEET 3 of 3

**Note:** If bidder(s) qualifies on the basis of credentials of his principal/ JV partner/ Collaborator/ joint bidder etc., then the principal/ JV partner/ Collaborator/ MOU partner/ joint bidder shall be responsible for overall design vetting and warranty/ guarantee of the package. The scope matrix clearly defining their respective roles including design vetting, manufacturing of critical component, E&C etc. and warranty/ guarantee shall be submitted along with the offer.

2.2 Bidder to note that the arrangement of bidding (joint bid partners/ collaborator/ MOU partner/ licensing company etc.) once offered to BHEL as a part of bidding documents cannot be changed till the execution of contract(s).

2.3 Consideration of offer shall be subject to customer's approval of bidders, if applicable.

2.4 Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self-attested English translated document should also be submitted.

2.5 After satisfactory fulfilment of all the above criteria/ requirement, offer shall be considered for further evaluation as per NIT and all the other terms of the tender.

2.6 Bidder to ensure that Third Party/customer issued certificates being submitted as proof of PQR qualification should have verifiable details of document/ certificate issuing authority such as name & designation of issuing authority and its organization contact number and email-id etc. In case the same found not available, purchaser has right to reject such document from evaluation.

2.7 Attached annexure (**Annexure-1: Sub-vendor questionnaire**) to be filled by the bidders (i.e. Sub-vendors of Main Contactor) on quality & general terms. Requisite Documents (like factory registration certificate, R&D set-up details etc.) asked in the Annexure-1, shall also be attached as Annexure-F2.1 to Annexure F2.17 along with the filled response in the Annexure-1.

2.8 Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder/collaborators to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.

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## **ANNEXURE-1**

### **SUB-VENDOR QUESTIONNAIRE**

<b>i.</b>	<b>Item/Scope of Sub-contracting</b>			
<b>ii.</b>	<b>Address of the registered office</b> 	<b>Details of Contact Person</b> <b>(Name, Designation, Mobile, Email)</b> 		
<b>iii.</b>	<b>Name and Address of the proposed Sub-vendor's works where item is being manufactured</b> 	<b>Details of Contact Person:</b> <b>(Name, Designation, Mobile, Email)</b> 		
<b>iv.</b>	<b>Annual Production Capacity for proposed item/scope of sub-contracting</b>			
<b>v.</b>	<b>Annual production for last 3 years for proposed item/scope of sub-contracting</b>			
<b>vi.</b>	<b>Details of proposed works</b>			
<b>1.</b>	<b>Year of establishment of present works</b>			
<b>2.</b>	<b>Year of commencement of manufacturing at above works</b>			
<b>3.</b>	<b>Details of change in Works address in past (if any)</b>			
<b>4.</b>	<b>Total Area</b>			
	<b>Covered Area</b>			
<b>5.</b>	<b>Factory Registration Certificate</b>	<b>Details attached at Annexure – F2.1</b>		
<b>6.</b>	<b>Design/ Research &amp; development set-up</b> <b>(No. of manpower, their qualification, machines &amp; tools employed etc.)</b>	<b>Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design</b> <b>Details attached at Annexure – F2.2</b> <b>(if applicable)</b>		
<b>7.</b>	<b>Overall organization Chart with Manpower Details</b> <b>(Design/Manufacturing/Quality etc)</b>	<b>Details attached at Annexure – F2.3</b>		
<b>8.</b>	<b>After sales service set up in India, in case of foreign sub-vendor</b> <b>(Location, Contact Person, Contact details etc.)</b>	<b>Applicable / Not applicable</b> <b>Details attached at Annexure – F2.4</b>		
<b>9.</b>	<b>Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any</b>	<b>Details attached at Annexure – F2.5</b>		
<b>10.</b>	<b>Sources of Raw Material/Major Bought Out Item</b>	<b>Details attached at Annexure – F2.6</b>		
<b>11.</b>	<b>Quality Control exercised during receipt of raw material/BOI, in-process, Final Testing, packing</b>	<b>Details attached at Annexure – F2.7</b>		



## ANNEXURE-1

### SUB-VENDOR QUESTIONNAIRE

12.	<b>Manufacturing facilities</b> (List of machines, special process facilities, material handling etc.)	Details attached at Annexure – F2.8
13.	<b>Testing facilities</b> (List of testing equipment)	Details attached at Annexure – F2.9
14.	<b>If manufacturing process involves fabrication then-</b>	Applicable / Not applicable
	List of qualified Welders	Details attached at Annexure – F2.10
	List of qualified NDT personnel with area of specialization	(if applicable)
15.	List of out-sourced manufacturing processes with Sub-Vendors' names & addresses	Applicable / Not applicable  Details attached at Annexure. –F2.11 (if applicable)
16.	Supply reference list including recent supplies	Details attached at Annexure – F2.12 (as per format given below)
Project/ package	Customer Name	Supplied Item (Type/Rating/Model /Capacity/Size etc)
PO ref no/date	Supplied Quantity	Date of Supply
17.	Product satisfactory performance feedback letter/certificates/End User Feedback	Attached at annexure - F2.13
18.	Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating) Note: - Reports need not to be submitted	Applicable / Not applicable  Details attached at Annexure – F2.14 (if applicable)
19.	Statutory / mandatory certification for the proposed product	Applicable / Not applicable  Details attached at Annexure – F2.15 (if applicable)
20.	Copy of ISO 9001 certificate (if available)	Attached at Annexure – F2.16
21.	Product technical catalogues for proposed item (if available)	Details attached at Annexure – F2.17
Name:	Desig:	Sign:
Date:		

Company's Seal/Stamp: -



**Bharat Heavy Electricals Limited**  
(A Govt. Of India Undertaking)  
**PROJECT ENGINEERING MANAGEMENT**

**ANNEXURE-I**

**BALL VALVES (FRAMEWORK AGREEMENT)**

DTD. 03.03.2025

**PVC Clause:**

Ex-works prices shall be variable as per PVC formula given below:

$$\text{Current Price} = \text{Order Price} * (0.15 + 0.6 * M1/M0 + 0.25 * L1/L0)$$

Where

**M0** = INDICES AS PER RBI BULLETIN TABLE 21 SL NO.: 1.3.14.2 (METALLIC IRON) FOR ONE MONTH PRIOR TO MONTH OF ORDERING OF FRAMEWORK AGREEMENT PO.

**M1** = INDICES AS PER RBI BULLETIN TABLE 21 SL NO.: 1.3.14.2 (METALLIC IRON) FOR ONE MONTH PRIOR TO MONTH OF DISPATCH OF MATERIAL AGAINST PROJECT SPECIFIC PO.

**L0** = INDICES AS PER RBI BULLETIN TABLE 19 (ALL INDIA CONSUMER PRICE INDEX FOR INDUSTRIAL WORKER) FOR ONE MONTH PRIOR TO MONTH OF ORDERING OF FRAMEWORK AGREEMENT PO.

**L1** = INDICES AS PER RBI BULLETIN TABLE 19 (ALL INDIA CONSUMER PRICE INDEX FOR INDUSTRIAL WORKER) FOR ONE MONTH PRIOR TO MONTH OF DISPATCH OF MATERIAL AGAINST PROJECT SPECIFIC PO.

**NOTE:**

- 1. Total PVC shall be limited to + 20% of Ex-Works Value actually supplied and -ve (negative) price variation shall be unlimited.**
- 2. Latest Index Values**, as per RBI bulletin shall be considered, for all the factors.
- The price adjustment i.e. either increase or decrease shall be applicable upto the contractual date of completion of supplies. Contractual delivery/dispatch date would mean the delivery/dispatch date mentioned in the order including amendments in delivery/dispatch date (if any). PVC will not be applicable for the period beyond the contractual delivery/dispatch date where delay is attributable for supplier.
- The PVC shall be applicable for main, commissioning and mandatory spares.
- Source link of RBI bulletin: [https://www.rbi.org.in/scripts/BS\\_ViewBulletin.aspx?Id=19681](https://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=19681)