

(The Technical requirements in this entire Annexure A/ Section-C are specific to the project and shall prevail over/ override the corresponding technical requirements specified under Section-D of Technical Specifications, in case of any contradiction)

1.0 SCOPE OF SUPPLY: Following are the Requirements of Butterfly Valves (Water System) - MAIN SUPPLY

Sl. NO.	TAG NO.	SIZE (MM) NB	TYPE OF VALVE	OPERATION	DESIGN		SERVICE	BODY MATL.	TRIM MATL. & VALVE INTERNALS***	BODY RATING	TESTING OF VALVES	TEST PRESSURE SHELL / SEAT Kg/Cm ² (g)AS PER BSEN-593	DISC STRENGTH TEST PRESSURE Kg/Cm ² (g) AS PER AWWA C504	HYD. SEAT TEST PRESSURE FOR VALVE WITH ACTUATOR OPERATION	END DETAIL	MATCHING PIPE OD (mm) X THKN(mm)	SPECIAL FEATURES	TOTAL QTY MAIN SUPPLY (NOS) WITHOUT COMMISSIONING SPARES	UNIT EX-WORKS(₹)	TOTAL EX-WORKS(₹)	FREIGHT in % age of Ex-works (₹)	TOTAL FOR CHA GO-DOWN MUMBAI PORT(₹)
					PRESSURE KG/CM ²	TEMP. °C																
1	ACW-23 TO ACW-26, ACW-40 TO ACW-43, ACW-57 TO ACW-60 (EACH 2 Nos.), RO-7, RO-8, RO-9 (EACH 1 No.)	65 BfV	MAN		10	60	WATER (ACW & PW SYSTEM)	CLASS PER IS210 Gr. FG280	ASTM A479 TYPE 410	PN 10 OF BS EN 593 (replaces BS 5155)	BS EN 593/ AWWA C504	15/11		15	DOUBLE FLANGED FLAT FACED & DRILLING AS PER BSEN 1092-2 (PN16)	76.5X4.5	LEVER OPERTD., SOFT SEAT	27				
2	ACW-21, ACW-22, ACW-27, ACW-28, ACW-38, ACW-39, ACW-41, ACW-45, ACW-55, ACW-56, ACW-61, ACW-62 (EACH 2 Nos.), SW-3, SW-14, PW-3, PW-14, RO-15, SUMP PUMP DISCHARGE (4 NOS)	80 BfV	MAN		10	60	WATER (ACW, SW & PW SYSTEM)	--DO--	--DO--	CLASS 150 OF AWWA C504	AWWA C504	21/10.5		21	DOUBLE FLANGED FLAT FACED & DRILLING AS PER ASME B 16.1 CLASS 125	89.5X4.8	LEVER OPERTD., SOFT SEAT	33				
3	ACW-9, ACW-10, ACW-17 TO ACW-20, ACW-34 TO ACW-37, ACW-51 TO ACW-54, ACW-74, ACW-76 (EACH 2 Nos.), SW-2, SW-28, SW-29, SW-33, SW-34, SW-36, SW-38, SW-43, SW-49, SW-50, PW-2, PW-36 (EACH 1 No.)	100 BfV	MAN		10	60	WATER (ACW, SW & PW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	115X5.4	LEVER OPERTD., SOFT SEAT	45				
4	SW-91, SW-94	100 BfV	MAN		10	60	WATER (SW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	115X5.4	LEVER OPERTD., SOFT SEAT WITH LIMIT SWITCH	2				
5	SW-1, SW-83, SW-96, PW-1	100 BfV	MO		10	60	WATER (SW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	11	--DO--	115X5.4	MOTORISED ELECTRIC ACTUATOR WITH INTEGRAL STARTERS OT=20 - 30 SECS	4				
6	ACW-13, ACW-29, ACW-30, ACW-46, ACW-47, ACW-63, ACW-72, ACW-73 (EACH 2 Nos.), SW-86, SW-87, SW-88 (EACH 1 No.)	150 BfV	MAN		10	60	WATER (ACW, SW & PW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	166.5X5.4	LEVER OPERTD., SOFT SEAT	19				
7	RO-1, RO-4	150 BfV	MAN		10	60	WATER (RO SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	166.5X5.4	LEVER OPERTD., SOFT SEAT WITH LIMIT SWITCH	2				
8	ACW-16, ACW-33, ACW-50 (EACH 2 Nos.), RO-3, RO-6 (EACH 1 No.)	150 BfV	MO		10	60	WATER (ACW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	11	--DO--	166.5X5.4	MOTORISED ELECTRIC ACTUATOR WITH INTEGRAL STARTERS OT=20 - 30 SECS	8				
9	ACW-68, ACW-69 (EACH 2 Nos.), SW-94, SW-96 (EACH 1 No.)	200 BfV	MO		10	60	WATER (ACW & SW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	11	--DO--	219.1X6	MOTORISED ELECTRIC ACTUATOR WITH INTEGRAL STARTERS OT=20 - 30 SECS	6				
10	ACW-64, ACW-65 (EACH 2 Nos.)	250 BfV	MAN		10	60	WATER (ACW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	273X6	GEAR OPERTD., SOFT SEAT WITH LIMIT SWITCH	4				
11	ACW-5 TO ACW-8, ACW-5C, ACW-6C (EACH 2 Nos.)	300 BfV	MAN		10	60	WATER (ACW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	323.9X6	GEAR OPERTD., SOFT SEAT	12				
TOTAL																		162				

Commissioning spares -> One set each of Bottom Gasket with 'O' Rings& Seals, Gland Packing with 'O' ring & seals in Gland packing area, Upper Gasket etc as applicable.
--- FOR DETAIL MATERIAL OF CONSTRUCTION REFER CLAUSE 3.2 OF TECHNICAL SPECIFICATION NO. PE-SS-999-100-M008

Signature of the bidder with name,designation,date and company's seal

LEGENDS :
MAN = MANUAL GO =GEAR OPERATED
MO = MOTORISED (ELECTRIC ACTUATOR)
VALVE:-
- Main valve prices shall BE EXCLUSIVE of cost of Commissioning Spares prices.
- Bidder is required to quote unit price of each & every item under commissioning spares separately & individually i.e. prices of all commissioning spares shall not be clubbed/ included in the unit price of Main valves.

Tisha

2x200 MW TISHREEN TPP

(page 2 of 3)

(The Technical requirements in this entire Annexure A/ Section C are specific to the project and shall prevail/ over over-ride the corresponding technical requirements specified under Section D of Technical Specifications, in case of any contradiction)

1.0 SCOPE OF SUPPLY: Following are the Requirements of Butterfly Valves (Water System) - Commissioning Spares.

SL NO.	TAG NO.	SIZE (MM) NB	TYPE OF VALVE	OPERATION	DESIGN		SERVICE	BODY MATL.	TRIM MATL. & VALVE INTERNALS***	BODY RATING	TESTING OF VALVES	TEST PRESSURE SHELL / SEAT Kg/Cm ² (g)AS PER BSEN-593	DISC STRENGTH TEST PRESSURE Kg/Cm ² (g) AS PER AWWA C504	HYD. SEAT TEST PRESSURE FOR VALVE WITH ACTUATOR OPERATION	END DETAIL	MATCHING PIPE OD (mm) X THKN(mm)	SPECIAL FEATURES	COMMISSIONING SPARES			UNIT EX-WORKS(₹)	TOTAL EX-WORKS(₹)	FREIGHT in %age of Ex-works(₹)	TOTAL FOR SITE CHA GO-DOWN MUMBAI PORT(₹)
					PRESSURE KG/CM ² g	TEMP.°C												GLAND PACKING (O-RING) SETS	BOTTOM GASKET SETS	ACTUATOR SPARES SETS				
1	ACW-23 TO ACW-26, ACW-40 TO ACW-43, ACW-57 TO ACW-60 (EACH 2 Nos.), RO-7, RO-8, RO-9 (EACH 1 No.)	65 BFV	MAN		10	60	WATER (ACW & PW SYSTEM)	CLASS PER IS210 Gr. FG250	ASTM A 479 TYPE 410	PN 10 OF BS EN 593 (replaces BS 5155)	BS EN 593 AWWA C504	15/11			DOUBLE FLANGED FLAT FACED & DRILLING AS PER BSEN 1092-2 (PN16)	76.5X4.5	LEVER OPERTD., SOFT SEAT	27	27	----				
2	ACW-21, ACW-22, ACW-27, ACW-28, ACW-38, ACW-39, ACW-44, ACW-45, ACW-55, ACW-56, ACW-61, ACW-62 (EACH 2 Nos.), SW-3, SW-14, PW-3, PW-14, RO-15, SLUMP PUMP DISCHARGE (4 NOS.)	80 BFV	MAN		10	60	WATER (ACW, SW & PW SYSTEM)	--DO--	--DO--	CLASS 150 OF AWWA C504	AWWA C504	21/10.5		21	DOUBLE FLANGED FLAT FACED & DRILLING AS PER ASME B 16.1 CLASS 125	89.5X4.8	LEVER OPERTD., SOFT SEAT	33	33	----				
3	ACW-9, ACW-10, ACW-17 TO ACW-20, ACW-34 TO ACW-37, ACW-51 TO ACW-54, ACW-74, ACW-76 (EACH 2 Nos.), SW-2, SW-24, SW-28, SW-29, SW-33, SW-34, SW-38, SW-39, SW-43, SW-49, SW-90, PW-2, PW-36 (EACH 1 No.)	100 BFV	MAN		10	60	WATER (ACW, SW & PW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--		--DO--	115X5.4	LEVER OPERTD., SOFT SEAT							
4	SW-91, SW-94	100 BFV	MAN		10	60	WATER (SW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--		--DO--	115X5.4	LEVER OPERTD., SOFT SEAT WITH LIMIT SWITCH	2	2	----				
5	SW-1, SW-83, SW-96, PW-1	100 BFV	MO		10	60	WATER (SW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	11	--DO--	115X5.4	MOTORISED ELECTRIC ACTUATOR WITH INTEGRAL STARTERS OT=20 -30 SECS	4	4	4 SETS OF O-RING AND SEALS				
6	ACW-13, ACW-29, ACW-30, ACW-46, ACW-47, ACW-63, ACW-72, ACW-73 (EACH 2 Nos.), SW-86, SW-87, SW-98 (EACH 1 No.)	150 BFV	MAN		10	60	WATER (ACW, SW & PW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--		--DO--	166.5X5.4	LEVER OPERTD., SOFT SEAT	19	19	----				
7	RO-1, RO-4	150 BFV	MAN		10	60	WATER (RO SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--		--DO--	166.5X5.4	LEVER OPERTD., SOFT SEAT WITH LIMIT SWITCH	2	2	----				
8	ACW-16, ACW-33, ACW-50 (EACH 2 Nos.), RO-3, RO-6 (EACH 1 No.)	150 BFV	MO		10	60	WATER (ACW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	11	--DO--	166.5X5.4	MOTORISED ELECTRIC ACTUATOR WITH INTEGRAL STARTERS OT=20 -30 SECS	8	8	8 SETS OF O-RING AND SEALS				
9	ACW-68, ACW-69 (EACH 2 Nos.), SW-94, SW-96 (EACH 1 No.)	200 BFV	MO		10	60	WATER (ACW & SW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--	11	--DO--	219.1X6	MOTORISED ELECTRIC ACTUATOR WITH INTEGRAL STARTERS OT=20 -30 SECS	6	6	6 SETS OF O-RING AND SEALS				
10	ACW-64, ACW-65 (EACH 2 Nos.)	250 BFV	MAN		10	60	WATER (ACW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--		--DO--	273X6	GEAR OPERTD., SOFT SEAT WITH LIMIT SWITCH	4	4	----				
11	ACW-5 TO ACW-8, ACW-5C, ACW-6C (EACH 2 Nos.)	300 BFV	MAN		10	60	WATER (ACW SYSTEM)	--DO--	--DO--	--DO--	--DO--	--DO--	--DO--		--DO--	323.9X6	GEAR OPERTD., SOFT SEAT	12	12	----				
TOTAL																								

Commissioning spares --> One set each of Bottom Gasket with 'O' Rings& Seals, Gland Packing with 'O' ring & seals in Gland packing area, Upper Gasket etc as applicable.
*** FOR DETAIL MATERIAL OF CONSTRUCTION REFER CLAUSE 3.2 OF TECHNICAL SPECIFICATION NO. PE-SS-999-100-M008

LEGENDS :
MAN = MANUAL GO =GEAR OPERATED
MO = MOTORISED (ELECTRIC ACTUATOR)
VALVE:-

- Main valve prices shall BE EXCLUSIVE of cost of Commissioning Spares prices.
- Bidder is required to quote unit price of each & every item under commissioning spares separately & individually i.e. prices of all commissioning spares shall not be clubbed/ included in the unit perice of Main valves.

Bidder

Signature of the bidder with name,designation,date and company's seal

**2 X 200 MW TISHREEN THERMAL POWER STATION EXTENSION
PROCUREMENT OF BUTTERFLY VALVES (WATER SYSTEM)**

**ANNEXURE-A
PAGE 3 of 3**

1	Offered Gear Box & electric actuator shall be designed & tested in accordance with latest editions of per AWWA C504 & AWWA C540 (actuator) respectively. In case the Gear box is not earlier POD tested for any NTPC job/ Reputed Power Plant customer, then the bidder to carry out POD Test on Gear Box, at their own cost, in line with clause 3.5 of attached Tech Spec. No. PE-SS-999-100-M008. No separate charges for Gear POD Test shall be quoted by the bidder as these tests are the mandatory requirements of AWWA C504 and of this enquiry technical specification, therefore, the charges/ costs on this account, if any, may be built in the quoted unit prices of valves. NO EXTRA CHARGES ON THIS ACCOUNT IS ADMISSIBLE TO BIDDERS.
2	In case POD Test on valves covered in this enquiry is not done earlier by the bidder for any NTPC project/ Reputed Power Plant customer, then the bidder is required to carry out POD test on valves in line with clause 3.4 of above mentioned Tech spec. No. PE-SS-999-100-M008 of the purchase order at their own cost (size of the valve to be POD tested will be decided by the purchaser at contract stage) i.e. no extra charges permissible to bidder as the valve POD test is the mandatory requirements of AWWA C504 as well as of this enquiry technical specification. POD TESTED VALVE WILL NOT BE SUPPLIED TO CUSTOMER / BHEL. CHARGES OF POD TEST, MATERIALS USED DURING POD TEST, OR ANY OTHER TESTING COST SHALL BE BUILT IN/ INCLUDED IN QUOTED UNIT PRICE OF VALVES. NO EXTRA CHARGES ON THIS ACCOUNT IS ADMISSIBLE TO BIDDERS.
3	Bidder to submit an Offer of Recommended Spare as specified in clause no.1.3 of specification NO. PE-SS-999-100-M008 for future ordering.
4	The technical requirements for Butterfly valves shall, in general, be as per Tech Specification No. PE-SS-999-100-M008 including material of construction & painting.
5	Specification of Electric Actuators shall be as per "MOTOR OPERATED VALVE ACTUATOR DATA SHEET – Spec. NO. PE-ID-323-145-1902 REV 00 (5 Sheets) & WIRING DIAGRAM NO. 3-V-MISC-24283 REV 0 (1 sheet) attached herewith in place of Spec.No. PE-SS-999-145-I007 indicated at clause 6.2.5 of butterfly valve Spec. No. PE-SS-999-100-M008 section-D. Actuators shall be selected for full open & full close operation only i.e. on- off duty for all valves of this Technical Specification. Bidder to only confirm to comply with above electric actuator specification and therefore, need not submit the same duly filled up with the offer since this data sheet will be required at contract stage in case of order on the bidder. However the bidder is required to indicate the following details in their technical offer while submitting the bids: 1) Actuator Make, model no., size/ rating, opening closing time of valve, the actuator's rated torque etc. of the offered Electric Actuator. 2) Required Valve torque value, valve spindle details, selected Gear box make, model & rated torque etc. as indicated in clause 6.2.3 of the above standard Tech Spec.
6	Documentation required shall be as per attached Annexure 'B'.
7	Inspection & Testing shall be by both BHEL & customer jointly or separately.
8	All test and inspection shall be as per attached Quality Plan. The bidder to return a copy of the same duly signed and stamped as a token of acceptance. However the bidder to get Quality Plan approved from the customer, in case of order, without any commercial implication to BHEL.
9	Vendor has to supply main quantity along with commissioning spares and mandatory spares.
10	<p>TECHNICAL OFFERS FROM BIDDERS</p> <p>No detailed offer and drawing/ Data Sheets are required to be submitted along with the technical bid. Bidder to note that no kind of deviation is acceptable to BHEL. Instead, bidder shall categorically specify "NO DEVIATION" in their bid document and in addition submit a confirmation to comply to this specification in totality. The bidder to also return copy of the total enquiry Tech Specification duly signed with their company stamp as a token of acceptance.</p> <p>NOTE:-- The bidders who have never supplied earlier butterfly valves to BHEL are required to submit their detailed technical offers in line with clause 11.1 to 11.8 of Technical sSpecification NO. PE-SS-999-100-M008</p> <p>The successful bidder, in case of order, will be required to submit drawings, calculations and stamped copy of Quality Plan after award of contract within 15 days for BHEL's approval. Based on BHEL's comments, vendor will be required to make necessary changes, if required, on these documents so that the valves meet the technical requirements of this specification. BHEL reserves the right to make modification to minor design detail like ends/weld details, etc. and the vendor will comply with BHEL requirements.</p>

Tishreen