

1x600 MW RAVALSEEMA TPP UNIT-6 STAGE-IV (PRICE FORMAT-MAIN SUPPLY)

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

1.0 SCOPE OF SUPPLY: Following are the Requirements of Steam Service Butterfly Valves/ main Supply) . Detailed technical requirement, technical data & material of construction shall be as per Annexure-A1 , also applicable for design & selection of valves, actuators & operators

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
S NO.	TAG NO.	SIZE (MM)	TYPE OF VALVE	BODY MATL.	RATING	END . CONNECTION	MATCHING PIPE X THK (MM)	SPECIAL FEATURES	QTY. MAIN VALVES ( WITHOUT COMMISSIONING SPARES)	Unit Ex- works (₹)	Total Ex- works (₹)	ED@ % (₹)	CST@ % (₹)	Freight as a % of Ex- works (₹)	Total FOR Site Price (₹)
1	EXV-27, EXV-28 ( 1 Nos. EACH)	1800 NB	BUTTERFLY VALVE (LONG BODY DESIGN AS PER AWWA C-504)	CCS (ASTM A216 GR. WCB)	CL.75B OF AWWA-C-504	BW TO ASME B16.25	1826x10	SG. MO. OT = 50 ~ 70 SEC, IBR, SHAFT AXIS ORIENTATION HORIZONTAL/ VERTICAL SUITABLE FOR BOTH DIRECTIONS; ELECTRIC ACTUATOR WITH INTEGRAL STARTER	2 Nos.						

ABBREVIATIONS:-

BW - BUTT WELDED, CCS - CAST CARBON STEEL, SG - SEALED GLAND, MO - MOTORISED ELECTRIC ACTUATOR OT - OPENING/CLOSING TIME OF VALVE WITH ELECTRIC ACTUATOR OPERATION IBR - INDIAN BOILER REGULATION IBR Test certificate in IBR Form IIC duly signed by approved IBR inspecting Agency shall be submitted.

NOTE:-

- Valve POD test charges/ Gear box POD test charges or any other test charges, required as per this technical specification, shall be not be included in the unit quoted prices of main valves as these tests are the mandatory requirements of valve governing standard AWWA C504 and this enquiry specification. If the bidder have not earlier carried these valve POD test and gear box POD test for any NTPC project, then the bidder is required to do these tests without any charges to BHEL, in case of order on the bidder i.e. NO EXTRA CHARGES ON THIS ACCOUNT IS ADMISSIBLE TO BIDDERS.
- Main valves shall be quoted exclusive of the cost of commissioning spares prices. Therefore, the bidders shall quote Unit price of each and every item under commissioning spares separately and individually.
- Bidder to note that Mandatory Spares valves if any ( complete valve with actuator) are required without any commissioning spares. Hence the quoted unit price of Mandatory spare valve shall not be inclusive of cost of Commissioning spares.

*Bidder*

Signature of the bidder with name, designation, date and company's seal
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**1x600 MW RAYALSEEMA TPP UNIT-6 STAGE-IV (PRICE FORMAT-COMMISSIONING SPARES)**

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

**1.0 SCOPE OF SUPPLY:** Following are the Requirements of Steam Service Butterfly Valves (Commissioning Spares). Detailed technical requirement, technical data & material of construction shall be as per Annexure-A1, also applicable for design & selection of valves, actuators & operators

1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19
S NO.	TAG NO.	SIZE (MM)	TYPE OF VALVE	BODY MATL.	RATING	END CONNECTION	MATCHING PIPE X THK (MM)	SPECIAL FEATURES	COMMISSIONING SPARES			Unit Ex-works (₹)	Total Ex-works (₹)	ED@ % (₹)	CS@ % (₹)	Freight as a % of Ex-works (₹)	Total FOR Site Price (₹)
									GLAND PACKING (VALVES)	BOTTOM GASKET (VALVES)	O RING AND SEALS FOR ELECTRIC ACTUATORS						
1	EXV-27, EXV-28 (1 Nos. EACH)	1800	BUTTERFLY VALVE (LONG BODY DESIGN AS PER AWMA C-504)	CCS (ASTM A216 GR. WCB)	CL.75B OF AWMA-C-504	BW TO ASME B16.25	1826x10	SG. MO. OT = 50 ~ 70 SEC, 1BR, SHAFT AXIS ORIENTATION HORIZONTAL/ VERTICAL SUITABLE FOR BOTH DIRECTIONS. ELECTRIC ACTUATOR WITH INTEGRAL STARTER	2 SETS	2 Nos.	2 SETS						

**ABBREVIATIONS:-**

BW- BUTT WELDED CCS- CAST CARBON STEEL SG- SEALED GLAND MO- MOTORISED ELECTRIC ACTUATOR OT- OPENING/CLOSING TIME OF VALVE WITH ELECTRIC ACTUATOR OPERATION IBR- INDIAN BOILER REGULATION IBR Test certificate in IBR Form Ilic duly signed by approved IBR inspecting Agency shall be submitted.

**NOTE:-**

- Valve POD test charges/ Gear box POD test charges or any other test charges, required as per this technical specification, shall be not be included in the unit quoted prices of main valves as these tests are the mandatory requirements of valve governing standard AWMA C504 and this enquiry specification. If the bidder have not earlier carried these valve POD test and gear box POD test for any NTPC project, then the bidder is required to do these tests without any charges to BHEL, in case of order on the bidder i.e. NO EXTRA CHARGES ON THIS ACCOUNT IS ADMISSIBLE TO BIDDERS.

-Main valves shall be quoted exclusive of the cost of commissioning spares prices. Therefore, the bidders shall quote Unit price of each and every item under commissioning spares separately and individually.

-Bidder to note that Mandatory Spares valves if any ( complete valve with actuator) are required without any commissioning spares. Hence the quoted unit price of Mandatory spare valve shall not be inclusive of cost of Commissioning spares.

Signature of the bidder with name, designation, date and company's seal
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**1X600MW RAYALSEEMA TPP STAGE-IV**  
**PROCUREMENT OF STEAM SERVICE BUTTERFLY VALVES**

- 1.1 Main valves shall be quoted exclusive of the cost of commissioning spares prices. Therefore, the bidders shall quote unit price of each and every item under commissioning spares separately and individually.
- 2.0 An offer for Recommended Spares as specified at clause 1.3 of Standard Spec No. PE-SS-999-100-M016 shall be submitted with unit rates with validity for 5 years for future ordering by BHEL.
- 3.0 The design, manufacture and performance & testing of butterfly valves shall in general be as per attached Spec No. PE-SS-999-100-M016.
- 4.0 Valve P.O.D. Test and gear box POD test shall be as per clause 3.5 & 3.6 of standard Spec No. PE-SS-999-100-M016.
- 5.0 Valve POD test charges/ Gear box POD test charges or any other test charges, required as per this technical specification, shall be not be included in the unit quoted prices of main valves as these tests are the mandatory requirements of valve governing standard AWWA C504 and this enquiry specification. If the bidder have not earlier carried these valve POD test and gear box POD test for any NTPC project, then the bidder is required to do these tests without any charges to BHEL, in case of order on the bidder i.e. NO EXTRA CHARGES ON THIS ACCOUNT IS ADMISSIBLE TO BIDDERS. Valve POD test charges/
- 6.0 These valves are required for vacuum service and shall be provided with gland sealing arrangement which shall be vacuum tested with vacuum and helium gas (refer Quality Plan).
- 7.0 All NDT tests on castings, forgings, spindle and other parts shall be carried out as per the Quality Plan attached herewith. (also refer clause 7.0 of Spec No. PE-SS-999-100-M016). The bidder are required to return the QP duly signed with their company seal as token of acceptance by them.
- 8.0 Bidder to procure all castings (body & disc) and forgings (spindle) from reputed forging & casting supplier/ NTPC approved vendors only, if insisted by customer at contract stage without any commercial implications.
- 9.0 Bidder to submit Experience List for the offered valves.
- 10.0 Specifications of Electric Actuators FOR 1X600MW RAYALSEEMA TPP STAGE-IV shall be as per attached "Specification For Motorised Valve Actuator PE-SS-999-145-I007 in place of specifications indicated at clause 6.2.4 of Specification No. PE-SS-999-100-M016, Section-D of this specification. Actuators shall be selected for Full open & Full close operation
- 11.0 The bidder shall submit in their offer the Electric Actuator sizing calculations as specified at clause Spec No. 6.2.2 OF SPEC NO. PE-SS-999-100-M016. Based on the calculations, the bidder to indicate in their Technical Offer, the size/type/rating/make & model of selected electric actuator and gear box.
- 12.0 Bidder to submit all relevant testing procedures to purchaser's approval and all their Plant testing standards as per the QP.
- 13.0 Final approval of drawings/ documents, Quality Plans & testing procedures etc. shall be by customer and the successful bidder should proceed with manufacture only after obtaining necessary approvals of customer.
- 14.0 Inspection and testing shall be both by BHEL & Customer jointly or separately
- 15.0 DRAWINGS/DOCUMENTS TO BE SUBMITTED WITH THE TECHNICAL BID/ OFFER. ( These

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documents are required for evaluating the bidder's offer and therefore, in the absence of these below mentioned documents, their offers will not be evaluated.)

15.1 G.A. drg for the offered valves showing following information:

- i) Complete cross sectional arrangement of the valves indicating gear box, actuator and all accessories.
- ii) Bill of material incorporating all the materials of construction of various parts.
- iii) Dimensional details, dismantling clearance, valve weight, test pressure etc.
- iv) Special features such GA drawing for selected gear box with all technical details and electric actuator etc.
- v) List of sub-vendors for castings & forgings.
- vi) Experience list for specified size/ rating only.

15.2 All Data sheet-A & B of this enquiry duly filled up with technical details of Annexure-A

15.3 Detailed Electric Actuator sizing/ torque calculations for seating or unseating torque, dynamic torque and bearing friction torque indicating various coefficients of seating or unseating, dynamic torque, flow, bearing friction etc.

15.4 Wiring diagram and Data sheets for actuators duly filled up with technical details of actuator

15.5 CV testing reports, if any, already carried out for the offered enquiry Butterfly valves.

15.6 BHEL's standard Quality Plan duly stamped & signed as token of acceptance.

15.7 Relevant Proof-of-Design ( P.O.D.) test procedure for offered valve, disc strength test procedure and Gear box POD (cycle) test procedure etc. along with Data sheet. Test certificates (test results) of POD test for valve and POD (cycle) test for Gear box. Also procedures for Gland leak test (Top & bottom flanges) with helium gas and Vacuum test for Gland sealing arrangement . In case PODs on valve & gear box already done for any NTPC project, the vendor shall submit the relevant customer approved test procedures, GA drgs of BF valve/ gear box, Inspection test reports etc. along with their offers.

15.8 Confirmation that there is no deviations to Standard specification of Two way butterfly valves for steam service.

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TITLE:  
**TECHNICAL REQUIREMENTS, TECHNICAL DATA & MATERIAL DATA SHEET**  
**BUTTERFLY VALVES (STEAM SYSTEMS)**  
**1X600MW RAYALSEEMA TPP STAGE-IV**

SHEET 1 OF 2

**TECHNICAL REQUIREMENTS**

- |     |                                    |   |   |
|-----|------------------------------------|---|---|
| 1.  | Tag no.                            | : | EXV-27 & EXV-28   |
| 2.  | Quantity                           | : | One each (Total 2 nos.)   |
| 3.  | Total Qty.                         | : | Two nos   |
| 4.  | Type                               | : | Resilient seal.   |
| 5.  | Service                            | : | Butterfly valves shall be located in the exhaust ducts of the auxiliary drive turbines of the boiler feed pumps to isolate the aux. drive turbine from the surface condenser. |
| 6.  | Size (Nominal) mm                  | : | 1800  |
| 7.  | Flow medium                        | : | Wet Steam, 2-7% moisture  |
| 8.  | Flow Velocity (Design)             | : | 100 m/sec..   |
| 9.  | Operating parameters               | : | At normal condition      At maximum condition   |
|     |                                    |   | (Ref. HBD no.: PE-DC-371-100-N166)      (Ref. HBD no.: PE-DC-371-100-N249)  |
| 9.1 | Pressure ( kg/cm <sup>2</sup> (a)) | : | 0.105      0.105  |
| 9.2 | Flow (T/hr)                        | : | 42.34      43.82  |
| 9.3 | Dryness fraction                   | : | .936      .937  |

**TECHNICAL DATA**

- |    |                                     |   |  |
|----|-------------------------------------|---|--|
| 1. | Design Pressure                     | : | Full vacuum and 2 kg/cm <sup>2</sup> (g) |
| 2. | Design temp.                        | : | 100 Deg. C                               |
| 3. | End Connections                     | : | Butt welded                              |
| 4. | Connecting pipe size and material   | : | OD1826 x 10 thk.<br>SA672 Gr. B70        |
| 5. | Valve operation type                | : | Motor operated                           |
| 6. | Shaft Axis orientation              | : | Horizontal                               |
| 7. | Pipe line axis orientation          | : | Horizontal                               |
| 8. | Operation                           | : | Full open & full close                   |
| 9. | Design pressure drop at max. flow.: | : | 0.0002 kg/cm <sup>2</sup> (max.)         |

	<p style="text-align: center;">TITLE:  <b>TECHNICAL REQUIREMENTS, TECHNICAL DATA &amp; MATERIAL DATA SHEET</b>  <b>BUTTERFLY VALVES (STEAM SYSTEMS)</b>  <b>1X600MW RAYALSEEMA TPP STAGE-IV</b></p>
	SHEET 2 OF 2

**MATERIAL DATA SHEET (A-1)**

SL NO.	PART NAME	MATERIALS
<b>VALVE</b>		
a.	Valve Body Butt welded: (Long body butt weld ends )	ASTM A-216 Gr. WCB
b.	Valve Disc.	ASTM A-216 Gr.WCB
c.	Shaft	ASTM A182 Gr..F304
d.	Disc Seal/Seat	EPDM (70 ~ 75 SHORE 'A')
e.	Valve body seat edge	AISI 316 (WELD OVERLAY/ DEPOSIT)
f.	Seat retaining ring and internal Bolts etc.	SS 304/316
g.	Bearing	SLEEVE TYPE, SELF LUBRICATED
h.	Shaft seal :	'O' RINGS TYPE ( 65~70 SHORE 'A')
i.	Fasteners (bolts & nuts)	ASTM A193 Gr. B7 (BOLTS) / ASTM A194 Gr. 2H(NUTS)
j.	Hand wheel (actuator)	MALLEABLE IRON (NO OTHER ALTERNATE MATERIAL ACCEPTABLE)
<b>GEAR BOX. (Bevel type)</b>		
k.	Main Housing /Cover (Totally enclosed construction)	Cast Iron IS:210 Gr. FG 220/260
l.	Input shaft	13/% Cr SS/ EN8 ( ~200 BN)
m.	Worm	EN8 ( ~200 BN)
n.	Worm Wheel	Ductile iron / S.G iron
o.	Hand wheel	Malleable Iron

**TYPE OF ELECTRIC ACTUATORS:**

Electric Actuators shall be selected as per attached "Specification sheet for motorized valve Actuator, PE-SS-999-I45-I007".