



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

Enq No.: PE/PG/RTC/E-5473/2016

Date: 10.02.2017

TENDER ENQUIRY THROUGH E-PROCUREMENT

DUE DATE
MARCH, 04, 2017
2.00 P.M.

Subject: Tender Enquiry for Rate Contract of Flow Element-Orifice for two years

Dear Sir,

We are pleased to invite your tender offers for subject package. Please upload your best quotation/ offer in two (2) parts on <https://bheleps.buyjunction.in> for the requirement strictly as per schedule of price format before above mentioned due date & time. The details of the tender enquiry is as mentioned below:

Sl. No	Description for which Rate Contract is desired	Tentative Quantity	Delivery required
1	Flow Element-Orifice - Refer Technical specification no PE-TS-20-145-I105A for detailed description.	As per BOQ cum price schedule in Annexure-I) cumulative for the Prospective Projects as per Annexure-III.	The delivery period for all the items of Flow Element-Orifice shall be four (04) months from the PO date for respective project/requirement under the RC. Other schedules like submission of drawings, approval of drawings, inspection etc. shall be as per the Technical Specification no. PE-TS-20-145-I105A. Delays due to non-fulfilment of the requirements as specified in the specification shall be to the vendor's account. Vendors shall be informed that delivery period mentioned above is for contractual LD calculation purpose, however in case of exigencies BHEL may ask for early delivery.

(i) Rate contract on firm price basis is proposed for two year from placement of Rate Contract PO.

(ii) Rate contract shall be decided on the basis of Grand Total FOR site price of Total BOQ (as per Annex-I). Bidders to note that evaluation shall be done on CST basis, however in case, the entire business volume goes to one vendor (or volume of business shared between the vendors in line with enquiry) having manufacturing facility in the same state & it gets established that ordering on VAT is economical then BHEL may do suitable amendment in PO on case to case basis for taking care the provision of VAT in case of project falling in the same State where manufacturing factory of the vendor is also located.

(iii) Bidders requires to quote Grand Total FOR prices, taxes & freight in the price schedule for given BOQ in the tender. For price breakup of total ex-works, % allocation against each item of the BOQ is available at Annex-IA, the same has to be followed for calculation of price break-up. If bid found not confirming to % allocation given then, BHEL shall do the same & bidders have to accept.

Please reply to:
PEM -Power Sector
PPEI Building,
BHEL House
HRD & ESI Complex,
Plot-25, Sector-16-A NOIDA – 201301

Phone: 0120-4213591
Fax : 0120-4329026
e-mail: ncsharma@bhelpem.co.in

Regd. Office:

Siri Fort
New Delhi - 110049



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(iv) Refer Annex-I for tentative Qty of Flow Element-Orifice are required for prospective projects (refer Annex-III), however bidders will be asked to consider delivery anywhere in India. Quantity variation shall be applicable in line with cl. no. 6 of GCC rev-06. Project list is indicative only, BHEL may ask for delivery anywhere in India for any of the project added in the prospective project list/ requirement of existing projects during RC period.

(v) Rate Contract shall be done with 2 vendors in ratio of 60:40 value wise at L1 FOR site price for Flow Element-Orifice (% of splitting of RC between 2 vendors may be changed during ordering process if L1 bidder is not customer approved); however order for a project shall not be split the same shall be informed to bidders through NIT.

(vi) L1 rates shall be counter offered to vendors (L2, L3 & so on) in succession. If none accepts L1 rates, RC shall be done with L1 vendor for 100 % value. Since the rate contract is being proposed on two vendors, vendors shall be asked to quote prices with CST against form C and same state ordering shall not be done to save VAT.

(vii) Drawings/ documents, equipment manufacture inspection & dispatch requirement will be as per Technical Specification no. PE-TS-20-145-1105A.

(viii) **Pre-Qualifying Requirements (PQR):** All the bidders (registered/ non-registered) will be asked to submit documents fulfilling PQR requirements (as per enclosed annex-IV) with the bid & their further evaluation shall be done based on qualification in PQR.

(ix) Bidders to note that their bid shall be conditional subject to qualify PQR by registered vendors & non-registered vendors have to qualify PQR & get registered with PEM for the package.

For registration in PEM "Bidders needs to apply & get registered for subject package with PEM before P-2 (price bid opening) & **hence you need to apply online for registration on PEM web portal & have to enclose acknowledgement with this effect with the bid documents else your bid will not be considered for evaluation**"

Online Registration Portal is operational in BHEL. Non-registered Vendors, who wish to apply for registration with BHEL-PEM, have to apply through Online Registration Portal available at www.bhelpem.com → vendor section → Online Supplier Registration. All credentials and/or documents duly signed and stamped related to registration has to be uploaded on the website and submit the application for registration. One set of hard copy of the filled-up SRF downloaded from Online Registration Portal duly signed and stamped has to be submitted.

(x) Bidder are required to submit offer strictly in accordance with the requirements of the above tender documents. Deviations (Technical as well as Commercial) from NIT are generally not acceptable, if any, Technical deviations and Commercial deviations shall be furnished in "Cost of Withdrawal sheet" (as per Annexure-II of GCC Rev. 06, copy enclosed) **only under the headings "TECHNICAL DEVIATIONS" and "COMMERCIAL DEVIATIONS"** respectively, along with reasons for taking such deviations. Deviations (Technical & Commercial) taken other than as mentioned on cost of withdrawal sheet shall not be considered.

(GCC Rev. 06 is available on <http://www.bhelpem.com/Documents/GCC/GCC-Rev-06.pdf> , you are requested to kindly download the same).

Tender Enquiry Terms and Conditions: -

1. Offers should be submitted in two parts online at <https://bheleps.buyjunction.in> as follows:

Part-I: TECHNO-COMMERCIAL BID (along with un-priced copy of Annexure-I)

Please reply to:
PEM -Power Sector
PPEI Building,
BHEL House
HRD & ESI Complex,
Plot-25, Sector-16-A NOIDA – 201301

Phone: 0120-4213591
Fax : 0120-4329026
e-mail: ncsharma@bhelpem.co.in

Regd. Office:

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Part-II: PRICE BID (along with priced copy of Annexure-I)

2. For detailed instructions, please see clause no. 2 of "Instructions to Bidders" of GCC, Rev. 06.
3. No Technical & Commercial deviations are acceptable.
4. Standard pre-printed terms & conditions of the tenderers shall not be considered valid.
5. Bidder to submit complete tender in all respects duly signed & stamped on each and every page by the authorized signatory of the bidder as a token of acceptance of all the terms and conditions of tender.
6. Unsolicited fresh/ revised price bids shall not be entertained.
7. Tender will be opened at **03.00 PM on 04/03/2017**.
8. Purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any/ all tender(s) in part or full without assigning any reason whatsoever.
9. Purchaser reserves the right to split up the scope of the tender enquiry and place the orders for different scope/ items with different bidders and also increase or decrease the quantity.
10. BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.

Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. **The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.**

If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

As a reminder to the bidders, system will flash following message (in RED Color) during the course of 'online sealed bid':

"Bidders to submit online sealed bid less than or equal to their envelope sealed bid already submitted to BHEL"

Detailed guidelines of **reverse auction 2016** are available in "information section" of www.bhelpem.com, same are applicable for subject tender.

Tenders should be submitted ONLINE via e-Procurement System only, however, all correspondence thereof, shall be addressed to the undersigned by name & designation and sent at the

Please reply to:
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following address :

Mr. N.C Sharma, Sr.ENGR/MM e-mail : ncsharma@bhelpem.co.in Ph. No. 0120- 4213591	Mr. I P Singh, Sr. Mgr./ CMM e-mail: INDRA@bhelpem.co.in Ph. No. 0120-4368749
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However, for **Technical clarifications**, following persons may be contacted:

Mr. NIKHIL JAIN, Sr.ENGR./C&I e-mail: nikhiljain@bhelpem.co.in Ph. No.0120-4368583	Mr MAYANK KESHARWANI, MGR/C&I e-mail : makesharwani@bhelpem.co.in Ph. No.0120- 4368789
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- Any taxes and duties applicable on the date of bid but not quoted by the bidders shall be to the bidder account.
- Delivery terms for dispatches shall be FOR Dispatch Station.
- CIF is not available for this package.
- Bidders to submit their offers strictly in line with the enclosed Price Format (Annexure-I).
- This enquiry is subject to Conditions/ limits if any imposed in PMD / Vendor registration.
- Procurement of the subject package shall be done through e-procurement.
- All corrigenda, addenda, amendments, time extensions, clarifications etc. to the tender will be hosted on EPS website (<https://bheleps.buyjunction.in>), BHEL website (www.bhel.com), BHEL-PEM website (www.bhhelpem.com) & CPP Portal. Bidders should regularly visit websites to keep themselves updated.
- Foreign and indigenous bidders participating through open tender will necessarily have to buy class III DSCs issued by the certifying authorities in India for future tenders. Basic procedure /checklist has been uploaded on www.bhel.com for participating in tender enquires through e-procurement.
- Bidder to note that all other terms and condition shall be strictly as per NIT, GCC Rev. 06 & SCC. In the event of any contradiction in the terms and conditions mentioned, the order of preference shall be NIT (this letter) / SCC / GCC Rev. 06.

NOTE: In case you are not making an offer against this enquiry, you are requested to send a regret letter so as to reach us on or before the due date.

Thanking you,
Yours faithfully,
For and on behalf of BHEL

N.C Sharma
Sr.ENGR/ MM

नरेश चन्द्र शर्मा / Naresh Chandra Sharma
वरिष्ठ अभियंता (एम.एम.) / Sr. Engineer (MM)
भारत हेवी इलेक्ट्रिकल्स लिमिटेड / Bharat Heavy Electricals Ltd.
पावर सेक्टर-परियोजना इंजीनियरिंग प्रबंधन
Power Sector-Project Engineering Management
प्लॉट नं.-25, सेक्टर-16ए, नोएडा-201 301
Plot No. 25, Sector-16A, Noida-201 301

Enclosures:

- NIT (this letter itself)
- Technical Specification No. PE-TS-20-145-I105A
- Annexure-I: Price Format
- Annexure-IA: % Allocation Sheet
- Annexure-II: Special Conditions of Rate Contract (SCC).
- Annexure-III: List of prospective projects
- Annexure-IV: PQR (Pre-qualifying Requirement)
- Cost of Withdrawal sheet (Annexure-II of GCC Rev. 06)

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New Delhi - 110049

Annexure-I

PRICE FORMAT for RATE CONTRACT of ORIFICE ASSEMBLY (2017-18)

SL NO	DESCRIPTION	A						B						C		D			E		F											
		A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1	C2	D1	D2	D3	E1	E2		E3										
Complete Orifice assembly with pipe line material of SA106GRB / SA106GRC / CS AS PER IS 2062 GR B and flange material of ASTM A 105 (Ex-Works)		SCHEDULE OF PRICES for Complete Orifice assembly with THREE (3) pairs of tapping , accessories like pair of gasket , Pressure take-off points, Root valves, Nipples etc and commissioning spare of 1 no. pair of gasket for each assembly						SCHEDULE OF PRICES for Complete Orifice assembly with THREE (3) pairs of tapping , accessories like pair of gasket , Pressure take-off points, Root valves, Nipples etc and commissioning spare of 1 no. pair of gasket for each assembly						CALIBRATION CHARGES for Complete Orifice assembly						Complete Orifice assembly with pipe line material of SA312TP304 and flange material of ASTM A 182 F304 (Ex-Works)						PAIR OF GASKET (Ex-Works)		NIPPLE 15Nb , SS316 , 250mm long (Ex-Works)			ROOT VALVE SS316 15Nb # 900 (Ex-Works)	
		Additional items to be included based on project specific requirements (Item shall be applicable for any line size as mentioned in column A or B)																														
	PIPE SIZE	QTY	UNIT PRICE (EX WORKS)	TOTAL PRICE (EX-WORKS)	No.	UNIT PRICE (EX WORKS)	TOTAL PRICE (EX-WORKS)	No.	UNIT PRICE (EX WORKS)	TOTAL PRICE (EX-WORKS)	QTY	PRICE (EX WORKS)	QTY	UNIT PRICE (EX WORKS)	TOTAL PRICE (EX-WORKS)	QTY	UNIT PRICE (EX WORKS)	TOTAL PRICE (EX-WORKS)	QTY	UNIT PRICE (EX WORKS)	TOTAL PRICE (EX-WORKS)											
1	40" (1000 NB)	1			1											1																
2	36" (900 NB)	1			1																											
3	32" (800 NB)	1			1																											
4	28" (700 NB)	6			5																											
5	24" (600 NB)	3			3																											
6	20" (500 NB)	2			1																											
7	18" (450 NB)	9			7																											
8	16" (400 NB)	3			3																											
9	14" (350 NB)	2			2																											
10	12" (300 NB)	33			16																											
11	10" (250 NB)	6			3						1																					
12	8" (200 NB)	1			1						1																					
13	6" (150 NB)	1			1						1																					
14	4" (100 NB)	1			1						9																					
15	< 4" (<100 NB)	1			1						1																					
16	Total																															
17	Excise Duty @ _ _ _ _ (Rs.)																															
18	CST @ _ _ _ _ (Rs.)																															
19	Service Tax @ _ _ _ _ (Rs.) (applicable on Calibration charges)																															
20	Freight (@ _ _ _ _ in % of Ex-works) in Rs.																															
21	**GRAND TOTAL (Rs.)																															

The bidder to quote for items as per price schedule. The quantity as mentioned in the BOQ is only for evaluation purpose. However actual ordered quantity may vary from project throughout the year.
The L1 shall be evaluated on the total sum value as indicated in Col F Row 21. The value of Col F Row 21 shall be sum of all the values as specified in Row 16 of columns A3, A6, B3, C2, D3 & E3 and ED+CST+ST+ Freight.

The bidder to quote for items as per price schedule. The quantity as mentioned in the BOQ is only for evaluation purpose. However actual ordered quantity may vary from project to project throughout the year.

The L1 shall be evaluated on the total sum value as indicated in Col F Row 21. The value of Col F Row 21 shall be sum of all the values as specified in Row 16 of columns A3, A6, B3, B6, C2, D3 & E3 and ED+CST+ST+ Freight.

(Bidders' Seal & Sinn)

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Annexure-II: Special Condition of Rate Contract for Flow Element-Orifice

1. BHEL/PEM intends to enter into Rate Contract for the Flow Element-Orifice for a period of two year. The Rate Contract shall come into force from the date of issue of Purchase order for Rate Contract. Validity for ordering shall be one year from the purchase order for Rate Contract.
2. The items will be required against respective projects. Exact quantities and Project name shall be intimated while placing order for a specific project based on the Rate Contract.
3. The units rate for each item should be quoted inclusive of ex-works including packing & forwarding (excepted sea worthy packing) for tendered specifications/sizes as per price schedule format. Other elements of prices such as Excise Duty, Sales Tax, and freight charges (Including service tax) % of Ex-works are also to be indicated. Destination may be anywhere in India as per project requirement.
4. The freight charges shall be paid on percentage on ex-works prices or actual freight charges paid to transporter whichever is lower against production of documentary evidence. Vendor to quote freight charges as percentage (%) of ex-works price for destination anywhere in India.
5. Vendor to note that Excise Duty is payable on self manufacturing item only as per clause no 4.1.2 of GCC Rev 06 & hence for their BOI may quote Excise Duty is inclusive or Nil.
6. The prices shall remain firm during the period of one year.
7. Inspection of materials shall be carried out by BHEL / CQA and or by Customer or by an authorized agency at manufacture's works before dispatch, if required. Dispatch of material to be done, only after receipt of BHEL/Customer MDCC. It is responsibility of vendor to for obtain Material Dispatch Clearance Certificate (MDCC) from BHEL or CUSTOMER as required before dispatch of material.
8. Items have to be manufactured as per specification and supplied strictly in accordance with the approved BHEL / Customer's Drawings & Quality Plan. The items/ test certificate of items, which for any reason are not acceptable to BHEL / Customer, shall be required to be retested. No extra charge shall be payable on those account by BHEL.
9. Mode dispatch shall be by road through Schedule Bank/BHEL (PEM) approved transporters.
10. Other terms and conditions shall be as per Standard Technical specification no. PE-TS-20-145-I105A, GCC Rev 06 & Enquiry letter.
11. Order shall be placed with CST for respective projects keeping FOR site price same, vendors to quote accordingly.
12. This enquiry is subject to Conditions/ limits if any imposed in PMD/ Vendor registration.
13. Tentative quantity is given in enquiry.
14. Bidders to submit offer for RC of said items ONLINE via e-Procurement System only. Complete tender in all respects duly signed & stamped on each and every page by the authorized signatory of the bidder as a token of acceptance of all the terms and conditions of tender.
15. The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendor/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL web site <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud as soon as it comes to their notice.

ANNEX-III

Sl no.	Prospective Project List
1	Krishnapatnam 1x800MW
2	Vijaywada 1x800MW
3	Tuticorin 1x525MW
4	North Chennai 1x800MW
5	Uppur 2x800MW
6	Bangladesh 2x660MW



	PRE-QUALIFICATION REQUIREMENTS	PE-PQ-999-145-I003
		REVISION NO. 04 DATE 29/04/2016
		SHEET NO. 1 OF 1

ENQUIRY NO: (To be filled by PG)

PROJECT:

PACKAGE: **FLOW ORIFICE**

1.0	Supplier should be Original equipment manufacturer (OEM) for FLOW ORIFICE. "Supplier to comply to general points of PQR available at http://bhelpem.com/vensection/PMD/PMD.aspx in case supplier is not OEM , the offer shall be evaluated as per point no 1 of general points of PQR "
2.0	The Product being offered by the Supplier should be in use successfully in power plant or any other industrial application for at least 1 (One) year. Supplier to submit either of following supporting documents for the product: a. Copy of minimum 1 (One) Performance Certificate from end user / customer specifying that product is running successfully for 1 (One) year from date of commissioning. The certificate should clearly indicate date of commissioning, date of issue of certificate and name/designation of the certificate issuer. Copy of purchase order & technical parameter to be attached along with the performance certificate. OR b. Copy of repeat orders from minimum 2 (Two) different purchasers. Order received by supplier from same purchaser with a gap of minimum 2 (Two) years shall be considered as repeat order. Copy of technical parameters for each order to be attached.
3.0	Supplier to furnish experience list of last 5 years indicating customer name, purchase order reference, item supplied & year of supply to establish the continuity of business.

PREPARED BY	REVIEWED BY	APPROVED BY
NAME: DESIGNATION	NAME: DESIGNATION	NAME: DESIGNATION

ANNEXURE-II: DEVIATION SHEET (COST OF WITHDRAWAL)



PROJECT:-

PACKAGE:-

TENDER ENQUIRY REFERENCE:-

NAME OF VENDOR:-

SL NO	VOLUME/ SECTION	PAGE NO.	CLAUSE NO.	TECHNICAL SPECIFICATION/ TENDER DOCUMENT	COMPLETE DESCRIPTION OF DEVIATION	COST OF WITHDRAWAL OF DEVIATION	REFERENCE OF PRICE SCHEDULE ON WHICH COST OF WITHDRAWAL OF DEVIATION IS APPLICABLE	NATURE OF COST OF WITHDRAWAL OF DEVIATION (POSITIVE/ NEGATIVE)	REASON FOR QUOTING DEVIATION
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TECHNICAL DEVIATIONS

COMMERCIAL DEVIATIONS

PARTICULARS OF BIDDERS/ AUTHORISED REPRESENTATIVE

NAME	DESIGNATIONS	SIGN & DATE	
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NOTES:

- For self manufactured items of bidder, cost of withdrawal of deviation will be applicable on the basic price (i.e. excluding taxes, duties & freight) only.
- For directly dispatchable items, cost of withdrawal of deviation will be applicable on the basic price including taxes, duties & freight.
- All the bidders have to list out all their Technical & Commercial Deviations (if any) in detail in the above format.
- Any deviation not mentioned above and shown separately or found hidden in offer, will not be taken cognizance of.
- Bidder shall submit duly filled unpriced copy of above format indicating "quoted" in "cost of withdrawal of deviation" column of the schedule above along with their Techno-commercial offer, wherever applicable.
- Bidder shall furnish price copy of above format along with price bid.
- The final decision of acceptance/ rejection of the deviations quoted by the bidder shall be at discretion of the Purchaser.
- Bidders to note that any deviation (technical/commercial) not listed in above and asked after Part-I opening shall not be considered.
- For deviations w.r.t. Payment terms, Liquidated damages, Firm prices and submission of E1/ E2 forms before claiming 10% payment, if a bidder chooses not to give any cost of withdrawal of deviation loading as per Annexure-VIII of GCC, Rev-06 will apply. For any other deviation mentioned in un-priced copy of this format submitted with Part-I bid but not mentioned in priced copy of this format submitted with Priced bid, the cost of withdrawal of deviation shall be taken as NIL.
- Any deviation mentioned in priced copy of this format, but not mentioned in the un-priced copy, shall not be accepted.
- All techno-commercial terms and conditions of NIT shall be deemed to have been accepted by the bidder, other than those listed in unpriced copy of this format.
- Cost of withdrawal is to be given separately for each deviation. In no event bidder should club cost of withdrawal of more than one deviation else cost of withdrawal of such deviations which have been clubbed together shall be considered as NIL.
- In case nature of cost of withdrawal (positive/negative) is not specified it shall be assumed as positive.
- In case of discrepancy in the nature of impact (positive/ negative), positive will be considered for evaluation and negative for ordering.

**TECHNICAL SPECIFICATION
FOR
FLOW ORIFICE ASSEMBLY with
ACCESSORIES
(RATE CONTRACT)**

VOLUME - IIB

SECTIONS-C & D

SPECIFICATION No: PE-TS-20-145-I105A



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



Technical specification for
Flow Orifice Assembly with Accessories
 (RATE CONTRACT)

SPEC NO.: PE-TS-20-145-I105A

VOLUME II B

REV. NO. 00

DATE 06.02.17

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Technical specification for
Flow Orifice Assembly with Accessories
 (RATE CONTRACT)

SPEC NO.: PE-TS-20-145-I105A

VOLUME II B

SECTION C

REV. NO. 00

DATE 06.02.17

SECTION – C

- **SPECIFIC TECHNICAL REQUIREMENTS**
 - **CUSTOMER's SPECIFICATION**
 - **DATA SHEETS – A**
 - **DATA SHEETS – C**
 - **QUALITY PLAN**
 - **BOQ-MAIN SUPPLY**
 - **BOQ-SPARES**

	Technical specification for Flow Orifice Assembly with Accessories (RATE CONTRACT)	SPEC NO.: PE-TS-20-145-I105A	
		VOLUME II-B	
		SECTION C	
		REV. NO. 00	DATE: 06.02.17

SPECIFIC TECHNICAL REQUIREMENTS

- 1.0 This specification is intended for finalization of rate contract between BHEL-PEM and Bidder. Standard technical detail as indicated in the specification shall be agreed upon between BHEL-PEM and Bidder. Project specific technical detail shall be made available to the bidder along with project enquiry.
- 2.0 This specification covers the Design, Manufacture, Calibration (at approved labs), Inspection and testing at manufacturer's works, proper packing for transportation and delivery to site of the complete Orifice Plate assembly, Start-up/Commissioning Spares as mentioned in different sections of this specification.
- 3.0 The bids shall be evaluated as per NIT. Ordering shall be done separately for each project.
- 4.0 The quality plan enclosed forms the minimum requirement but not limited to be adhered to by the bidder.

5.0 GENERAL INSTRUCTIONS

- I. It is not the intent here to specify all the details of design and manufacture. However, the equipment shall conform in all respects to high standard of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to the customer / consultant, who will interpret the meaning of drawing and specification and shall be entitled to reject any component or material which in his judgment is not in full accordance herewith.
- II. The omission of specific reference to any component / accessory necessary for the proper performance of the equipment's shall not relieve the supplier of the responsibility of providing such facilities to complete the supply within the quoted prices.
- III. BHEL's / Customer representatives shall be given access to the shop in which the equipment's are being manufactured or tested and all test records shall be made available to them.
- IV. The Equipment covered under this specification shall not be dispatched unless the same have been finally inspected, accepted and Material Dispatch Clearance Certificate (MDCC) is issued by BHEL / Customer.
- V. **The bidder to quote for items as per price schedule attached. The quantity as mentioned in the BOQ is only for evaluation purpose. However actual ordered quantity may vary from project to project throughout the year.**
- VI. Rates quoted by bidder shall be valid for a period of 2 years from the date of issue of rate contract for the equipment.
- VII. During rate contract in force; any other BHEL unit may also make use of rates if their specification is identical to spec of rate contract.
- VIII. Inspection shall be carried out in line with preapproved project specific drawings/data sheet/QP.

	Technical specification for Flow Orifice Assembly with Accessories (RATE CONTRACT)	SPEC NO.: PE-TS-20-145-I105A	
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- IX. Quality plan to be duly signed and stamped and to be furnished along with the bid as a token of acceptance. **Any deviation w.r.t Quality Plan shall not be acceptable and bid / offer shall be rejected.**
- X. Wherever in data sheet more than one options are marked, bidder to comply for all the options. However bidder to note that one option shall be selected by BHEL for a specific project and the same shall be supplied by bidder without any commercial implication with respect to rate contract.
- XI. Scope of supply shall include flow element orifice assembly, stub nipples, root valves, pair of gasket, spares etc. as indicated in the specification.
- 6.0 Bidder to note that thickness of the pipe for various sizes may vary from project to project. Same shall be informed during project specific order. No commercial implication shall be acceptable for the same.
- 7.0 Bidder to note that CALIBRATION TEST is required to be conducted on one type per size for a specific project and the requirement shall be informed during project specific order. BHEL reserves the right to withdraw the calibration test for any project based on customer requirements.
- 8.0 For vertical installation of Orifices (if any), the S-bent impulse pipe shall be supplied by bidder without any commercial implication. The same shall be informed by BHEL during project specific order.
- 9.0 Process pressure, temperature & flow may vary for a particular service from project to project. Bidder to comply with these process parameters without any commercial implication. Maximum possible design pressure & temperature shall be informed during project specific order.
- 10.0 Extra pressure tapping (in addition to THREE pair no's tapping) shall be provided in case to case basis for a specific project (if required) by the bidder without any commercial implication. Associated accessories for this particular extra tapping like root valve & nipple shall be supplied by the bidder as per the unit price quoted in the price format.
- 11.0 If extra Root Valves, Nipples etc are to be provided, same shall be supplied by the bidder as per the unit price quoted in the price format.

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12.0 Inspection will be conducted by BHEL and/or their authorized representatives as per the agreed inspection schedule. The inspection schedule will be submitted by the bidder for BHEL's approval at contract stage. The cost of all tests and inspections will be deemed to have been included in the rate contract. For all the type tests "Type Test Certificates" shall be furnished. In the absence of the same, such Type Tests shall be arranged at the Vendor's works in the presence of BHEL and/or their authorized representatives or in independent Test House/ Laboratory approved by BHEL.

13.0 Sea/Air worthy packing (if applicable) for a specific project shall be provided by the bidder without any commercial implication. Same shall be informed by BHEL during project specific order. Inspection of the sea/air worthy packing shall be done as per the project specific sea/air worthy packing specification by Customer/BHEL/BHEL appointed Inspection party.

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CUSTOMER'S SPECIFICATION

Same shall be informed by BHEL during project specific order (if any)

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Tag No. : ORIFICE ASSEMBLY AS PER TYPE "A" OF THE PRICE FORMAT

Date Sheet No. 1

DATA SHEET – A		
ELEMENT	SERVICE MAKE : MODEL TYPE STANDARD* DESIGN# MATERIAL BETA RATIO BORE DIAMETER VENT HOLE DRAIN HOLE	SHALL BE FURNISHED DURING PROJECT BIDDER TO FURNISH DURING PROJECT [] BS-1042 / [] ISO 5167 SQUARE EDGE SS316 0.4 to 0.7 BIDDER TO FURNISH DURING PROJECT YES NO
END CONNECTION	TYPE FLANGE TYPE FLANGE RATING : MATERIAL TAPPING LOCATION NUMBER OF TAPPINGS ROOT VALVE: QTY : SIZE : TYPE : MATERIAL : RATING NIPPLE: QTY : SIZE : MATERIAL : RATING	[] FLANGED, [] BUTT WELD END WELDNECK ANSI-300 : ASTM A105 ON FLANGE 3 PAIR 06 : 15 NB : GLOBE TYPE : SS316 : ANSI # 900 06 : 15NB : SS316 : SCH.80 250mm Long
PROCESS DATA	FLUID* FLOW (T/HR) PRESSURE (KG/CM ² (A)) TEMPERATURE (DEG. C.) MAX. ALLOWABLE PRESS LOSS DESIGN PRESS : TEMP DIFF. PRESS AT MAX FLOW	[] CONDENSATE / [] DMCW / [] CW / [] ACW MAXIMUM NORMAL MINIMUM SHALL BE FURNISHED DURING PROJECT BIDDER TO FURNISH DURING PROJECT
PIPE LINE DATA	PIPE SIZE (OD X THK) mm PIPE MATERIAL* BORE DIAMETER MIN. AVAILABLE STRAIGHT LENGTH UPSTREAM:DOWNSTREAM FLOW DIRECTION*	<u>AS PER PRICE SCHEDULE</u> [] SA106GR.B / [] SA106GR.C / [] CS AS PER IS 2062 GR.B BIDDER TO FURNISH DURING PROJECT 15D 10D : 5D [] HORIZONTAL / [] VERTICAL ^{\$}
OTHER DATA	APPROX. WEIGHT OF ASSEMBLY COMMISSIONING SPARE	BIDDER TO FURNISH DURING PROJECT ONE PAIR OF GASKET FOR EACH ORIFICE ASSEMBLY
PACKING	SEA WORTHY PACKING*	[] YES / [] NO

\$ S-bent to be provided for vertical flow direction

* Project specific data shall be informed by BHEL during project ordering

Carrier ring design shall be provided (if required in a specific project) for line size <=2 inches

BIDDER TO QUOTE IN COLUMN "A" OF PRICE FORMAT FOR DETAILS SPECIFIED ABOVE

BIDDER TO NOTE THE FOLLOWING FOR EACH ORIFICE ASSEMBLY:

A) In case additional pair of tappings is required, extra 2 no's root valves & 2 no's nipples per pair of tappings shall be supplied by the bidder. Additional price for the same shall be as per unit price quoted in the price schedule under column D & E.

B) In case design pressure is greater than 40 Kg/cm², extra 2 no's root valves & 2 no's nipples per pair of tappings shall be supplied by bidder. Additional price for the same shall be as per unit price quoted in the price schedule under column D & E.

The above shall be informed by BHEL during project specific ordering

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Tag No. : ORIFICE ASSEMBLY AS PER TYPE "B" OF THE PRICE FORMAT

Date Sheet No. 2

DATA SHEET – A		
ELEMENT	SERVICE MAKE : MODEL TYPE STANDARD* DESIGN# MATERIAL BETA RATIO BORE DIAMETER VENT HOLE DRAIN HOLE	SHALL BE FURNISHED DURING PROJECT BIDDER TO FURNISH DURING PROJECT ☐ BS-1042 / ☐ ISO 5167 SQUARE EDGE SS316 0.4 to 0.7 BIDDER TO FURNISH DURING PROJECT YES NO
END CONNECTION	TYPE FLANGE TYPE FLANGE RATING : MATERIAL TAPPING LOCATION NUMBER OF TAPPINGS ROOT VALVE: QTY : SIZE : TYPE : MATERIAL : RATING NIPPLE: QTY : SIZE : MATERIAL : RATING	☐ FLANGED, ☐ BUTT WELD END WELDNECK ANSI-300 : ASTM A182 F304 ON FLANGE 3 PAIR 06 : 15 NB : GLOBE TYPE : SS316 : ANSI # 900 06 : 15NB : SS316 : SCH.80 250mm Long
PROCESS DATA	FLUID* FLOW (T/HR) PRESSURE (KG/CM ² (A)) TEMPERATURE (DEG. C.) MAX. ALLOWABLE PRESS LOSS DESIGN PRESS : TEMP DIFF. PRESS AT MAX FLOW	☐ CONDENSATE / ☐ DMCW / ☐ CW / ☐ ACW / ☐ DMW MAXIMUM NORMAL MINIMUM SHALL BE FURNISHED DURING PROJECT BIDDER TO FURNISH DURING PROJECT
PIPE LINE DATA	PIPE SIZE (OD X THK) mm PIPE MATERIAL BORE DIAMETER MIN. AVAILABLE STRAIGHT LENGTH UPSTREAM:DOWNSTREAM FLOW DIRECTION*	<u>AS PER PRICE SCHEDULE</u> SA312TP304 BIDDER TO FURNISH DURING PROJECT 15D 10D : 5D ☐ HORIZONTAL / ☐ VERTICAL ^S
OTHER DATA	APPROX. WEIGHT OF ASSEMBLY COMMISSIONING SPARE	BIDDER TO FURNISH DURING PROJECT ONE PAIR OF GASKET FOR EACH ORIFICE ASSEMBLY
PACKING	SEA WORTHY PACKING*	☐ YES / ☐ NO

\$ S-bent to be provided for vertical flow direction

* Project specific data shall be informed by BHEL during project ordering

Carrier ring design shall be provided (if required in a specific project) for line size <=2 inches

BIDDER TO QUOTE IN COLUMN "B" OF PRICE FORMAT FOR DETAILS SPECIFIED ABOVE

BIDDER TO NOTE THE FOLLOWING FOR EACH ORIFICE ASSEMBLY:

A) In case additional pair of tappings is required, extra 2 no's root valves & 2 no's nipples per pair of tappings shall be supplied by the bidder. Additional price for the same shall be as per unit price quoted in the price schedule under column D & E.

B) In case design pressure is greater than 40 Kg/cm², extra 2 no's root valves & 2 no's nipples per pair of tappings shall be supplied by bidder. Additional price for the same shall be as per unit price quoted in the price schedule under column D & E.

The above shall be informed by BHEL during project specific ordering



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SECTION C

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Tag No. :

Date Sheet No. :

DATA SHEET - C

ELEMENT	SERVICE MAKE : MODEL TYPE STANDARD DESIGN MATERIAL BETA RATIO BORE DIAMETER VENT HOLE DRAIN HOLE	
END CONNECTION	TYPE FLANGE TYPE FLANGE RATING : MATERIAL TAPPING LOCATION NUMBER OF TAPPINGS ROOT VALVE: QTY : SIZE : TYPE : MATERIAL : RATING NIPPLE: QTY : SIZE : MATERIAL : RATING	
PROCESS DATA	FLUID FLOW (T/HR) PRESSURE (KG/CM ² (A)) TEMPERATURE (DEG. C.) MAX. ALLOWABLE PRESS LOSS DESIGN PRESS : TEMP DIFF. PRESS AT MAX FLOW	MAXIMUM NORMAL MINIMUM
PIPE LINE DATA	PIPE SIZE (OD X THK) mm PIPE MATERIAL BORE DIAMETER MIN. AVAILABLE STRAIGHT LENGTH UPSTREAM:DOWNSTREAM FLOW DIRECTION	
OTHER DATA	APPROX. WEIGHT OF ASSEMBLY COMMISSIONING SPARE	
PACKING	SEA WORTHY PACKING	



PEM :: C&I

STANDARD QUALITY PLAN FOR FLOW ORIFICE ASSEMBLY

QUALITY PLAN NO.: PE-QP-20-145-1105A										
VOLUME IIB										
SECTION C										
REV. NO. 00 DATE: 06.02.17										
SHEET 1 OF 2										
STANDARD QUALITY PLAN FOR FLOW ORIFICE ASSEMBLY										
Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency \$ P W V	Remarks
1.0	MATERIAL									
1.1	Orifice Plate	1. Physical, Chemical properties 2. Dimensions	MA MA	Physical, Chemical Tests Measurement	One / Plate OR One/ Heat 100%	AP / DS / SP AP	AP / DS / SP AP	Lab Report IR	3/2 3/2	2,1 1 IBR certification (if applicable) to be verified by BHEL
1.2	Flanges A. Forgings B. Machining	Chemical, Mech Properties, UT & Heat Treatment Dimensions	MA MA	Chem & Mech UT test Measurement	Sample 100 %	Material Spec as per ASTM A 388 for UT AP / DS	ANSI B 16.34 AP / DS	MTC, UT cert, HT cert IR	3/2 3/2	1 1
2.0	IN PROCESS Machine	1. Dimension 2. Surface finish 3. Surface flaw on machined surface	MA MA MA	Measurement Visual Penetrant test	100% 100% 100%	AP ----- ASTM 165 / IS:3658	AP Mirror Finish No surface flaw	IR ----- IR / TC	3/2 3/2 3/2	2 2 2 2 1
3.0	ASSEMBLY and FINAL INSPECTION	1. Overall dimensions 2. Marking, Tag no. Direction of flow 3. Calibration 4. Painting 5. Root valve BOQ	MA MA MA MA MA	Measurement Visual Performance Test Visual Measurement	100% 100% One per type 100% 100%	AP AP / DS ----- SP / MS AP / DS	AP AP / DS SP SP / MS AP / DS	IR IR TC IR / MR IR	3/2 3/2 3/2 3/2 2	2,1 2 --- --- 1 1 1 1
LEGEND: * CR - Critical characteristics MA - Major characteristics MI - Minor characteristics IR - Inspection Reports TC - Test Certificates AP - Approved Drawings/doc DS - Data Sheet SP - Tech. Spec. MS- Manufacturer standards MR- Manufacturer records \$ P - Agency Performing the Test. W - Agency Witnessing the Test. V - Agency Verifying the Test. 1- BHEL 2 - Vendor 3- Sub-vendor 4.-Customer/ Consultant										

 STANDARD QUALITY PLAN FOR FLOW ORIFICE ASSEMBLY		QUALITY PLAN NO.: PE-QP-20-145-1105A										
		VOLUME IIB										
		SECTION C										
		REV. NO. 00					DATE: 06.02.17					
		SHEET 1					OF 2					
Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency [§]			Remarks
									P	W	V	
4.0	PACKING	Soundness of Packing against transit damage	MA	Visual	100%	SP / MS	SP / MS	---	3/2	---	---	Refer Note 4

NOTE:

1. All test reports & dimension reports shall be verified by BHEL wherever verification is by BHEL at the time of Final Inspection.
2. Positive material identification testing shall be performed by vendor and the same shall be witnessed by BHEL (if required).
3. Minimum 2 coats of primer paint to be applied before dispatch.
4. CALIBRATION Test to be carried out at IIT-DELHI / FCRI or BHEL approved laboratory.
5. Sea Worthy packing (if applicable) shall be provided by vendor without any commercial implication.

LEGEND: * CR - Critical characteristics IR - Inspection Reports DS - Data Sheet MR- Manufacturer records § P - Agency Performing the Test. 1- BHEL 4.-Customer/
MA - Major characteristics TC - Test Certificates SP - Tech. Spec. MS- Manufacturer standards W - Agency Witnessing the Test. 2 - Vendor Consultant
MI - Minor characteristics AP - Approved Drawings/doc V - Agency Verifying the Test. 3- Sub-vendor



**Technical specification for
Flow Orifice Assembly with Accessories
(RATE CONTRACT)**

SPECIFICATION NO.: PE-TS-20-145-I105A

VOLUME IIB

SECTION C

REV. NO. 00

DATE : 06.02.17

BILL OF QUANTITY-MAIN SUPPLY

BOQ for RATE CONTRACT of ORIFICE ASSEMBLY (2017-18)								
SL NO	DESCRIPTION	A		B		C	D	E
		Complete Orifice assembly with pipe line material of SA106GRB / SA106GRC / CS AS PER IS 2062 GR B and flange material of ASTM A 105		Complete Orifice assembly with pipe line material of SA312TP304 and flange material of ASTM A 182 F304		PAIR OF GASKET	NIPPLE 15Nb, SS316, 250mm long	ROOT VALVE SS316 15Nb # 900
		A1	A4	B1	B4	C1	D1	E1
		SCHEDULE OF PRICES for Complete Orifice assembly with THREE (3) pairs of tapping, accessories like pair of gasket, Pressure take-off points, Root valves, Nipples etc and commissioning spare of 1 no. pair of gasket for each assembly	CALIBRATION CHARGES for Complete Orifice assembly	SCHEDULE OF PRICES for Complete Orifice assembly with THREE (3) pairs of tapping, accessories like pair of gasket, Pressure take-off points, Root valves, Nipples etc and commissioning spare of 1 no. pair of gasket for each assembly	CALIBRATION CHARGES for Complete Orifice assembly	Additional items to be included based on project specific requirements (Item shall be applicable for any line size as mentioned in column A or B)		
	PIPE SIZE	QTY	No.	QTY	No.	QTY	QTY	QTY
1	40" (1000 NB)	1	1	X	X	1	200	200
2	36" (900 NB)	1	1					
3	32" (800 NB)	1	1					
4	28" (700 NB)	6	5					
5	24" (600 NB)	3	3					
6	20" (500 NB)	2	1					
7	18" (450 NB)	9	7					
8	16" (400 NB)	3	3					
9	14" (350 NB)	2	2					
10	12" (300 NB)	33	16					
11	10" (250 NB)	6	3	1	1			
12	8" (200 NB)	1	1	1	1			
13	6" (150 NB)	1	1	1	1			
14	4" (100 NB)	1	1	9	7			
15	<4" (<100 NB)	1	1	1	1			

	Technical specification for Flow Orifice Assembly with Accessories (RATE CONTRACT)	SPECIFICATION NO.: PE-TS-20-145-I105A	
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BILL OF QUANTITY-SPARES

[A] LIST OF COMMISSIONING SPARES

ONE PAIR OF GASKET FOR EACH ORIFICE ASSEMBLY
 (As specified in each datasheet)

[B] LIST OF MANDATORY SPARES

NONE



Technical specification for
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SECTION D

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SECTION – D

EQUIPMENT SPECIFICATION



Technical specification for
Flow Orifice Assembly with Accessories
(RATE CONTRACT)

SPEC NO.: PE-TS-20-145-I105A

VOLUME II B

SECTION D

REV. NO. 00

DATE : 06.02.17

1.0 SCOPE

This specification covers the design, manufacture, calibration, inspection and testing at the manufacturer's works, proper packing for transportation and delivery to site of flow measuring devices (orifices) for use in Utility/Captive Power Station/Combined Cycle Station.

2.0 CODES AND STANDARDS

2.1 All the equipment specified herein shall comply with the requirements of the latest issue of the relevant National and International standards.

2.2 The Design and Materials used for the components shall also comply with the relevant National and International standards.

2.3 As a minimum requirement, ISO 5167 / BS 1042 standard shall be complied with for Flow Orifices.

3.0 TECHNICAL REQUIREMENTS

The orifice plates shall be used as the primary flow sensing elements. These sensing elements shall provide a safe and reliable means of creating differential pressure for use in flow measurement.

3.1 Orifice Plates

The orifice plate assemblies shall conform to the following requirements unless specified otherwise in the corresponding data sheets.

3.1.1 Type:

The Orifice plates shall be of concentric type, designed and manufactured as per BS-1042 / ISO 5167. The data sheet enclosed specifies the requirements of each orifice plate assembly. The bidder shall calculate the Beta ratio and validate suitability of the selected design for the specified application, Vent holes, if required for the specified duty shall be located at the top and drain holes at the bottom of the orifice.

3.1.2 Material: The material of the Orifice plates shall be stainless steel type SS 316, unless otherwise specified.

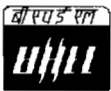
3.1.3 Orifice Plate thickness shall be ≥ 3 mm (min.) for pipes having diameter ≤ 250 mm and shall be ≥ 6 mm (min.) for pipes having diameter up to 500 mm and shall be ≥ 10 mm (min.) for pipes having diameter up to 1000mm unless otherwise specified for a specific project.

3.1.4 Assembly: Orifice plates shall be supplied as complete assemblies, along with companion flanges on both sides having proper end connection for welding on to the associated pipe at site, gaskets, nuts & bolts. The carrier ring assembly shall be supplied along with corner taps for orifice assembly having sizes ≤ 2 inches, if required in a specific project. End flanges along with Counter flanges shall be provided as per requirement. Concentric Square edge orifice shall be provided with downstream beveled edge.

Each flow orifice assembly shall be provided with minimum THREE pairs of pressure tapping complete with associated root valves, suitable for the service conditions. The pressure tapping shall be provided either on the carrier ring or on the companion flanges as the case may be.

Extra Root Valve shall be provided for normal pressure above 40 Kg/cm².

Extra pressure tapping (other than the THREE tapping's mentioned above) complete with associated root valves and other accessories shall be provided in case to case basis for a specific project if required.



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Each orifice plate or the carrier ring assembly (as the case may be) will also be provided with an extended handle. The Tag No. and duty will be permanently marked on both the sides of this handle.

3.1.5 Flanges: The flanges shall conform to latest revisions of ANSI B 16.5 / ASME B16.36 / ASME B16.47 (B). The companion flange and the carrier ring material shall be same as that of the main pipe. These shall be manufactured from forged material. Companion flanges shall be suitably rated for the specified service conditions.

3.1.6 Hydraulic test pressure for Assembly shall be 1.5 times of the design pressure at normal temperature

3.1.7 While machining the ID to maintain a uniform internal diameter, care shall be taken to ensure the minimum thickness of the branch pipe as per IBR regulations.

3.2 Guarantee & Performance

The guarantee for the flow orifice assemblies shall be for 12 months continuous operation from the date of commissioning.

4.0 TESTS & INSPECTION

4.1 The equipment covered under this specification shall be subject to vendor's quality plan to be approved by the purchaser before start of manufacturing. To ensure that quality is in-built in each equipment the quality assurance system manual indicating the system followed by the vendor shall be submitted to purchaser for his review.

4.2 The quality plan forming part of this specification shall be the minimum requirements for the vendor's quality plan to be submitted with the offer. The vendor shall give at least 15 days written notice to purchaser for witnessing the tests/inspection at various stages. The expenses for all such tests/inspection shall be to manufacturer's account except for the expenses of purchaser's representatives witnessing the tests. The purchaser shall attend such tests/inspection within 15 days failing which the manufacturer may proceed with the tests which shall be deemed to have been made in purchaser's presence and shall furnish relevant test certificates to the purchaser.

4.3 One orifice plate of each type and size for each project unless specified shall be tested and calibrated by the bidder at customer/BHEL approved laboratory, within his quoted price. Details of the calibration test i.e., type of test, equipment's employed etc. shall be submitted in the bid.

4.4 IBR certification, if required for the specified service shall be obtained by the successful bidder from the concerned authority for submission to the purchaser.

4.5 The Standard QP is included in this specification to enable bidder to understand the extent of inspection and testing requirements to execute this job. The successful bidder has to follow the agreed QP, taking care of customer requirements mentioned in Sec-C and submit QP for final approval by BHEL / Customer.

5.0 DRAWINGS & DOCUMENTS

(A) For RATE CONTRACT: Following documents shall be submitted:

- a) Quality plan duly signed and stamped.
- b) Datasheets duly signed and stamped.
- c) Schedule of submission of Drg. /Doc, Manufacture, Inspection and Dispatch signed and stamped.
- d) Unpriced bid format of Price Schedule.

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(B) After the award of project specific contract :

The documentation as listed below to be submitted, separately for respective projects.

3 sets of the following documents + 3 sets of CDs to be submitted for Approval:

- Assembly drawing of all type of Flow Element assemblies complete with all accessories indicating detailed dimensions, BOM and weights.
- Flow Element Edge preparation details.
- Installation drawings for the flow elements.
- Technical Data sheet-C completely filled-up.
- Quality Plan duly signed and stamped.
- Bore size calculations for Flow orifices for all the conditions indicated in the data sheets.
- Differential Pressure Vs Flow, curve for each Orifice.
- All relevant catalogues for the models of the Flow Element Assemblies as well as accessories finalized.
- Bar chart to indicate the time schedule for procurement, manufacture, testing and dispatch.

(C) Final documentation for a project:

Final documentation shall contain 10 sets with 5 CD-ROMS of each of the following:

- Category –I & IV Approved final drawings/data sheets, Bore sizing calculations, DP Vs Flow Curve for each Orifice.
- Verified test certificates
- Approved Quality Plan
- Calibrations Reports
- Quality Inspection Report
- Operation & Maintenance Manuals for Flow Element Assemblies and all the accessories (Containing storage & commissioning instructions).

6.0 PACKING & MARKING

6.1 Packing: Each orifice plate assembly and the associated accessories shall be packed properly with adequate protection against friction, stresses, vibrations and shocks during transportation. Each packing shall have markings as per Purchase Order / Special Condition of the Contract (SCC).

6.2 Marking: A SS name plate shall be permanently fixed on each equipment. Each flow element assembly shall be identified with the following information:

- Tag Number
- Service
- Element Material
- Beta ratio
- Line size & thickness
- Direction of flow

7.0 APPLICABLE DATA SHEET FORMS

This document shall be read with one or more of the following data sheet forms:

- Data sheet A for Flow-Orifice: DS-"X" (X=1 to 2)

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**SCHEDULE OF SUBMISSION OF DRAWINGS / DOCUMENTS, EQUIPMENT MANUFACTURE
INSPECTION AND DESPATCH**

- | 1. <u>ZERO DATE</u> | <u>DATE of LOI / FOI / TOI</u> |
|--|---------------------------------------|
| 2. Submission of Data Sheets / documents / catalogues / Sizing calculations for approval. | 2 Weeks from the Zero date. |
| 3. Technical finalisation, freezing of inputs of manufacture by way of vetting of documents and technical discussions and resubmissions of documents (if required) | 6 Weeks from the Zero date. |
| 4. Inspection of Equipment as per Approved (Category-I) drawings / documents. | 14 Weeks from the Zero date. |
| 5. Release of MDCC by BHEL | 15 Weeks from the Zero date. |
| 6. Dispatch (Packaging & Dispatch) | 16 Weeks from the Zero date. |
| 7. Final documents submission as per Contract | 16 Weeks from the Zero date. |

NOTE: Delays due to non-fulfillment of the requirements of approved Quality Plan and approved Data sheets, Drawings, Catalogues and Sizing Calculations observed during inspection shall be to the Vendor's account.

Delays due to INCOMPLETE (Partly) submission of Data sheets, Drawings, Catalogues and Sizing Calculations also be considered as **"DOCUMENTS NOT SUBMITTED"**

(Signature and Stamp of the Bidder)