

BHEL : PIPING CENTRE : CHENNAI – 600 017

ENQUIRY NO : 4101200096 DT 03.10.12

A) IMPORTANT INFORMATION TO BIDDERS.

1. This Tender is an Open Tender for manufacturing & supply of SA182 F92 fittings.
2. Bids are to be submitted in **TWO PARTS**.
3. **Bids shall be submitted by Non Chinese vendors only. Offers from Chinese vendors will not be considered .**
4. The quoted price shall be "FIRM" till the complete execution of the scope.
5. Bids shall be in English only.
6. Last date for submission of Bid **30.10.12 - Time - 14.00 Hours**.
7. Techno-Commercial Bid Opening Date **30.10.12 - Time - 14.30 Hours**.
8. Tender shall be processed through Price bid opening . However BHEL reserves the right to go for "Reverse Auction" instead of sealed tender bid which will be decided after technical cum commercial bid evaluation.
9. Bidders shall submit the Bid (a single envelope containing two inner envelopes) in English language as indicated below:

Envelope I – "TECHNO COMMERCIAL BID": This sealed envelope should contain

- Point by point confirmation for Eligibility criteria as per Para B given below (All required details as called for to be furnished)
- Point by point confirmation / acceptance to our Commercial terms as per Para D
- Vendor's Catalogue
- Unpriced bid (copy of the Priced Bid without the price details) .
- **Duly filled BHEL Checklist.** (Checklist Enclosed)

This envelope should be clearly marked "Part I - Technical and Un-priced commercial bid ", indicating Enquiry No., Due Date, Address & Reference of the Bidder.

Envelope II – "PRICE BID": This sealed envelope should contain price details. This envelope should be clearly marked "Part II - Price bid", indicating Enquiry No., Due Date, Address & Reference of the Bidder.

The Bid (consisting of both the envelopes mentioned above) , sealed and superscribed as "Parts I & II inside" indicating Enquiry No., Due Date, Address & Reference of the Bidder should reach the below mentioned address on or before the due date by 14:00 Hrs (IST). BIDS RECEIVED AFTER 14:00 Hrs (IST) WILL NOT BE CONSIDERED FOR EVALUATION.

10. The above bid (a single envelope containing two inner envelopes) shall be sent in a sealed cover duly indicating

Enquiry No. & date, Tender Opening date and Item Description: " SA182 F92 FITTINGS "

To

**SDGM / MATERIALS
BHEL - Piping Centre
Old No 93, (New No:80) G N Chetty Road
T Nagar / Chennai 600 017 . PHONE : 28161243 / 28161355**

11. Only the vendors who meet the eligibility criteria as per Para B shall be considered against this tender .

B) ELIGIBILITY CRITERIA**B.1) GENERAL CONDITIONS:**

- a. Firm shall be a regular manufacturer of forgings of SA182 F92 specification .
Traders /Agents/Distributors/Dealers are not acceptable.
- b. Firm should have been in continuous business of manufacturing Forgings for the past 5 years and should have had a positive business result in the past 2 years.
- c. In case of SA182F92 Forgings, firm should have manufactured and supplied forgings confirming to SA182F92 specification and sizes relevant to enquired size. The supplied F92 forgings should have been in use in at least two different power plants for minimum of 2 years. Experience details containing Customer name, size & quantity month and year of their supplies relevant to enquired size and specification shall be furnished with Customer contact details to verify the performance of the supplied materials , if required.
- d. In case of SA182F92 fabricated Tees & Y-pieces, firm should have fabricated and supplied items relevant to enquired size & specification. The supplied F92 fabricated items should have been in use in at least two different power plants for minimum of 2 years. Experience details containing Customer name, size & quantity month and year of their supplies relevant to enquired size and specification shall be furnished with Customer contact details to verify the performance of the supplied materials,if required.
- d. Firm shall have valid ISO 9001 certification or equivalent.
- e. Indigenous Firms referred to BIFR or Firms having strictures/hold by any other Government agencies will not be considered (applicable for Indigenous Sources). All import sources shall provide D&B report on Financial soundness.

B.2) TECHNICAL:

BHEL requires SA182 F92 Fittings conforming to BHEL Technical specification as mentioned below:

a) Group A : Fabricated Tees and Y Pieces as per TDC no TDG:108:REV 06 (Refer Annexure 1)

Vendor to submit the following, for approval by BHEL/ PC, along with the Technical offer.

- i) Welding documents "Welding Procedure Specifications" (WPS) and "Procedure Qualification Records"(PQR) for F92 specification.
- ii) Confirmation regarding availability of NDE procedures called for in above referred TDC no **TDG:108:REV 06**
- iii) Point to point acceptance to **TDG:108:REV 06**

b) Group B : Forged & Machined fittings as per TDC:104:REV 04 (Refer Annexure 1)

Vendor to submit Point to point acceptance to **TDC:104:REV 04** along with the Technical offer.

Only the bidders meeting the above eligibility criteria (General and Technical) will be considered for further evaluation of technocommercial and price bids.

In case the firm is already registered with any of the BHEL units , the proof for the same shall be furnished

C) LIST OF ITEMS :

The enquiry quantity is furnished in Annexure 1 . Vendors may also note the following :

- 1) Lowest Bidder (L1 bidder) will be determined for each SI no. Ordering will be made on competitiveness of prices quoted against each item and not as total package.
- 2) Quantity mentioned in Annexure-1 may undergo changes during processing of the tender .

D) Commercial:

The bidders are requested to furnish their acceptance / confirmation to each of the below mentioned commercial points in their Techno-commercial Bid.

1. **Address :** Full address of the Manufacturing unit and the corporate office along with the contact details to be provided .
2. **Delivery period** – Supplies to be completed within
 - (i) 4 months from the date of LOI / Purchase Order for Group A .
 - (ii) 3 months from the date of LOI / Purchase Order for Group B .

Delivery is the essence of the Contract/ PO. BHEL may accept or reject the bid if delivery is not as specified, or if offered delivery is not suiting Project Plan/ Production plan as per BHEL.

BHEL has the right to order partly or fully considering the various requirements.

BHEL may short close/cancel an order or divert to another vendor at any time during the currency of the Contract/PO irrespective of the PO Delivery date

- (i) if the performance of the vendor is poor,
- (ii) if the delivery requirement of the item is very critical and not being met,
- (iii) if there is no response for improvement in delivery as per BHEL requirement.

3. Delivery Terms:

Foreign Bidders shall submit their bid for CFR, Chennai (preferred) or FOB (port to be mentioned) . Prices shall include Testing , Inspection , Packing & Forwarding charges . Do not quote on Ex-Works basis . Vendors quoting on CFR basis shall arrange for FREE container retention period of 21 days for clearance of cargo.

Inland transport from the port of discharge upto Trichy stores will be loaded for comparison with Indigenous bids to obtain net cash outflow to BHEL. Ranking will be based on Net Cash Outflow to BHEL.

Indian Bidders shall submit their bid for FOR - Trichy/Site (Anywhere in India) (inclusive of Packing , Forwarding , Freight & transit insurance). Rates quoted shall be inclusive of all charges. Taxes & Duties to be indicated separately. Do not quote on Ex-Works basis .

4. Bids shall be free from CORRECTION AND ERASURES, Corrections if any, must be attested.
Note: Bidders are requested to submit their bids only through sealed bids. As the part II (priced bid) will not be opened before the technical evaluation is completed, bidders are requested not to submit their bids through email/fax etc.
5. **Validity:** Bidder shall give a minimum validity of 90 days from the date of Technical bid opening.
6. **Fixed price:** All items should be quoted on "Per unit basis". Prices quoted by the bidder shall be fixed and not subject to any escalation whatsoever during the period of bid validity and execution of the Purchase Order. A bid submitted with an adjustable price will be liable for rejection.
7. **Bid currency:** Indian bidders should submit the prices only in Indian Rupees. Foreign bidders may submit their bid in EURO / USD / POUND. For the evaluation purpose the exchange rate (TT – Selling Rate of State Bank of India) on technical bid opening date will be considered.
8. **Taxes and Duties:** (for Indian Bidders only) All Taxes and Duties payable as extra to the quoted price should be specifically stated in their bids along with CST & TNGST No / Tariff No. etc., failing which the purchaser will not be liable for payment of such Taxes and Duties.

9. **MODVAT Credit:** (for Indian Bidders only) If any Excise Duty is payable, the chapter head / sub-head reference and the rate of the duty should be quoted. If the bidder is availing MODVAT credit for this input material, the effect of proforma credit should be passed on to the purchaser.

10. **Payment Terms:** NO ADVANCE PAYMENT SHALL BE MADE BY BHEL.

Indian Bidders - The payment term is 100% payment after 45 days of satisfactory acceptance of materials at BHEL, Trichy Stores, against submission of despatch documents directly to BHEL and not to be routed through Bank. As per policy, LC will not be opened. Bids with LC requests/advance payments are liable for rejection.

Payment shall be made against presentation of following documents to our Finance Department .

However a copy of Invoice and LR shall be sent to Purchase department immediately after the dispatch is effected.

- Invoice in Triplicate
- Delivery Challan in duplicate.
- Guarantee certificate in duplicate.
- Lorry Way Bill Copy
- Proof of receipt of material at Trichy stores
- Inspection report & Test Certificate copies
- ED gate pass original or copy with a confirmation that the original is sent with the goods.

Foreign Bidders - Payment shall be made on 100% CAD basis (Cash against documents)
If LC is requested , loading charges @ 1.5% of the basic charge will be applicable .

Documents required for payment :

- Bill of Lading
- Invoice
- Packing list
- Country of origin certificate
- Inspection report
- Test Certificate / Compliance certificate
- Performance Bank Guarantee

11. BHEL prefers the manufacturers to quote directly. In case this is not possible and the bid is being submitted through an Indian agent, the following details are to be furnished along with the bid:
- a. The letter from their Principal authorising the Indian agent to submit the bid on their Principal's behalf. In case the Indian agent submits bid on their own letter head then a covering letter (in original) from the Principal should be enclosed, clearly mentioning that they are bound by the bid submitted by the Indian agent on their behalf.
 - b. Precise relationship between foreign suppliers and their Indian agents and their mutual interest in business, should be clearly spelt out.
 - c. Any payment, which the agent receives in India or abroad, from the foreign supplier, whether as a commission or as a general retainer fee is to be mentioned in the bid.
 - d. All services to be rendered by the agent, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier and the Indian agent.
 - e. The amount of agency commission agreed to between the foreign principal and the Indian agent should be specifically disclosed and the agency commission will be paid in Indian Rupees only on satisfactory completion of the contract.
 - f. For calculation of rupee equivalent of agency commission, exchange rate as prevailing on the date of order will be taken.
 - g. Copy of current agency agreement is to be enclosed without which the bid is liable for rejection.

12. **Performance Bank Guarantee (PBG) – For INDIGENOUS & FOREIGN VENDORS:** The Bidder, in the event of an order, should furnish a Performance Bank Guarantee from any one of the attached list of consortium banks or counter-guaranteed by any one of this list of banks, at no extra cost in BHEL's Performa which will be provided by BHEL along with the order, for an amount equivalent to 10% (Ten percent) of the value of the contract. The Bank Guarantee should remain in full force and effect during a period of 24 months from the date of dispatch of materials or 18 months from the date of their commissioning whichever is earlier with an additional claim period of two months.
13. **Liquidated Damages:** If the supplier fails to deliver the fittings within the period specified in the contract the purchaser shall deduct Liquidated Damages, a sum equivalent to 0.5% of the price for each week of delay up to a maximum of **15%** of the price of delayed/undelivered portion.

LD, if applicable, will be levied from the order delivery date to the date of Bill of lading/LR in case of CFR/FOR contracts and to the date of the inspection in case of FOB contracts. Grace periods are not acceptable.

14. **Risk Purchase:** Alternatively the purchaser at his option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or despatch within the time stipulated as aforesaid or if the same were not available, the best and the nearest available substitute therefore. The supplier shall be liable for any loss which the Purchaser may sustain by reason of such risk purchases in addition to penalty at the rate mentioned under liquidated damages.
15. The correspondence between the bidder and BHEL through email is considered to be valid document legally though not signed. It is treated as valid confirmations made on behalf of the respective company and comes under the legal ambit of the business transaction and hence binding on both the parties.
16. Bidders participating in the tender should declare in their technical bid whether they have been black-listed / kept on hold / given Business holiday for a specified period by any Public Sector Undertaking or Government Departments. The reasons for such action with details and the current status of such hold shall be clearly furnished to BHEL. If no such details are mentioned in the bid, it will be construed that the bidder is not under any such hold. However, at a later date if it comes to the notice of BHEL about any such hold under enforcement, BHEL reserves the right to reject the bid at any point of time and also under any stage of the finalisation of the tender. Such bidders will not be permitted to participate in the further tender proceedings and will be communicated suitably.
17. **Packing and Marking:** The Supplier shall arrange for securely protecting and packing the stores to avoid loss or damages during transit.

18. Inspection :

For Indigenous vendors : Inspection shall be by BHEL / BHEL approved third party inspection agency . No inspection charges are applicable to the vendor. Inspection charges shall be borne by BHEL . However testing charges shall be included in vendors scope.

For Foreign vendors: Inspection shall be by reputed agencies like Lloyds , BV , SGS , TUV etc .. (Vendor shall indicate the name of the agency in the technical bid).Inspection charges shall be included in the quoted price .

19. Price bids of the Techno-commercially rejected vendors will not be considered.
20. BHEL reserves the right to negotiate L1 rate or re float the tender opened if L1 price is not the lowest acceptable price to them inter-alia other reasons.

21. Any other conditions which might have been quoted by the seller and are in contravention to the terms prescribed in the order and which have not been specifically accepted in by purchaser will not be applicable to the contract.
22. BHEL/End customer reserves the right to inspect the item ordered at any stage at vendor's works.
23. Date of price bid opening/Reverse Auction will be informed later after acceptance of bid on technical ground.
24. Bidders are to confirm to all the above points in their "Technical and unpriced commercial bid". In case of incomplete/inadequate information provided against the requirements of this tender, the bid shall be liable for rejection.

E) LIST OF DOCUMENTS ENCLOSED :

- Annexure 1 – List of items
- **BHEL Checklist** (To be filled by the vendor and sent along with Techno-commercial Bid)
- BHEL TDC:108:REV06
- BHEL TDC:104:REV04
- BHEL TDC 101:REV05 (Referred in TDC 108)
- List of Consortium Banks
- Performance Bank Guarantee Format
- Drawings

The above documents form part of this tender document and bidder shall ensure that they have received all these along with the tender .

Contact details of BHEL/Piping centre/Purchase:

G.NIVEDHA

Engineer / Purchase

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nivedha@bhempc.co.in

S.VARADARAJAN

Manager / Purchase

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K.RAJAN

Senior Manager / Purchase

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G.PANNEER SELVAM

SDGM / Materials

044-28161355

gps@bhempc.co.in

ANNEXURE – 1 – SA182 F92 FITTINGS REQUIREMENTS

(I) GROUP A - FABRICATED TEES AND Y PIECES

SL NO	MATLCD	DESCRIPTION	QTY (NOS)	TDC	DRG NO	CURRENCY	UNIT RATE (RATE PER NO)
A1	925057280000	FAB Y PIECE 864X40/ 711X33 SA182F92	3	108 REV 06	2 80 310 11242/01		
A2	925057290000	FAB UNEQUAL TEE 864X40/ 711X33 SA182F92	9	108 REV 06	3 80 310 28999/01		

(II) GROUP B - FORGED F92 FITTINGS

SL NO	MATLCD	DESCRIPTION	QTY (NOS)	TDC	DRG NO	CURRENCY	UNIT RATE (RATE PER NO)
B1	925167470000	THERMOWELL STUB OD 88 H149 SA182F92	24	104 REV 04	4-80-310-75208/02		
B2	925167480000	TEMP STUB OD75 L45 HWR SA182F92	18	104 REV 04	4-80-310-75207		
B3	925167490000	STUB OD 92 SA182F92	18	104 REV 04	4-80-310-75206/01		
B4	925167500000	SW STUB NB25 CL9000 SA182F92	90	104 REV 04	4-80-310-75205		
B5	921176890000	MAT.piece OD864x40/OD711x33/SA18 2F92	3	104 REV 04	4 80 310 74372/03		
B6	925167510000	TEMP STUB RC1.5 " OD114 L45 SA182F92	42	104 REV 04	4-80-310-75204		

“No raw material / component /other services for all the above items shall be sourced from China either directly or indirectly for manufacturing or supply”

SL NO	BHEL REQUIREMENT	AGREED / SUBMITTED
1	Quotes have to be submitted in TWO parts as per para A.9 & para A.10	
2	Point to point reply to eligibility criteria as per para B to be given in the offer . Supporting documents to be submitted.	
3	Confirmation to BHEL Technical specification TDC:108:REV 06	
4	Following to be submitted : a) Welding documents “Welding Procedure Specifications” (WPS) and “ProcedureQualification Records”(PQR). b) NDE procedures c) Vendor’s Quality Plan.	
5	Confirmation to BHEL Technical specification TDC:104:REV 04	
7	Deviations in BHEL’s Technical specification , if any , shall be clearly spelt out in the Techno-Commercial Bid. UNDISCLOSED DEVIATIONS ARE NOT ACCEPTABLE.	
8	Compliance to Annexure 1 indicating the list of items	
9	Vendor to mention the group for which they are quoting . Group A or Group B or Both the groups as per Annexure 1.	
10	Complete address of the Corporate office with contact details	
11	Complete address of the Manufacturing Unit with contact details	
12	Delivery period as per para D.2: a)4 months from the date of LOI / Purchase Order for Group A . b)3 months from the date of LOI / Purchase Order for Group B .	
13	Delivery Terms – Foreign Bidders as per para D.3 : CFR / CHENNAI or FOB (nearest port to be indicated) Vendors quoting on CFR basis shall arrange for FREE container retention period of 21 days for clearance of cargo.	

SL NO	BHEL REQUIREMENT	AGREED / SUBMITTED
14	Delivery Terms – Indigenous Bidders as per para D.3: FOR / BHEL Trichy Stores (Rates quoted shall be inclusive of Packing , Forwarding , Freight & Insurance)	
15	Bid Validity as per para D.5 : 90 days from the date of technical bid opening	
16	Prices to be quoted on “per unit basis” ie “ per no basis” Prices must be firm till the completion of supply.	
17	Bid currency - Foreign bidders : EURO / USD / POUND only	
18	Bid currency – Indigenous bidders: INR only	
19	Excise Duty / CST / VAT to be indicated as per para D.8	
20	Payment Terms – Foreign Bidders as per para D.10: 100% CAD basis If LC is requested , loading charges @ 1.5% of the basic charge will be applicable .	
21	Payment Terms – Indian Bidders as per para D.10: 100% payment after 45 days of satisfactory acceptance of materials at BHEL, Trichy Stores	
22	Documents to be submitted if an Indian agent is quoting for a foreign vendor as per para D.11	
23	Performance Bank Guarantee as per para D.12	
24	LD clause as per para D.13	
25	Risk Purchase clause as per para D.14	
26	Inspection as per para D.18 In case of foreign vendor , Name of the inspection agency to be furnished.	



1.0 GENERAL

Fabricated Tees and Y-piece shall meet Indian Boiler Regulations (IBR) and the following requirements in addition to the latest version of relevant material specifications namely ASME SA 105, SA 106, SA 182, SA 335.

2.0 FORGINGS.

2.1 Material : SA 105, SA 182 F11, F12, F22, F91 & F92 (Code Case 2179).

2.2 Carbon content of SA105 items shall be restricted to 0.25% maximum.

2.3 Unless otherwise specified in the P.O, items of SA182 F11/12 shall be supplied as per class 2 and SA182 F22 shall be supplied as per class 3 only.

2.4 Heat Treatment:-

2.4.1 All fittings shall be heat treated as below:

SA 105	- Normalised
SA 182 F11 / F12 / F22	- Normalised & Tempered

2.4.2 SA 182 F91 & F92 forgings shall be normalised at 1040 to 1070 deg C (for wall thickness larger than 75 mm, accelerated cooling may be done to obtain a fully martensitic structure) and tempered at 760 ± 10 deg C. Soaking time 1 hour minimum, still air cooling.

2.5 **Product analysis** shall be carried out on One piece / Heat / HT lot / Size.

2.6 **Tension test** shall be carried out on one Test piece for each specification, heat, heat treatment lot and size.

2.7 **Bend test:-** (a) For CS (SA 105) : One sample of 19 mm thick and 25mm width to be bent 180 deg around mandrel of radius 6.35mm.
(b) For AS (SA182): One Sample of 25.4 mm width and thickness = t to be bent 180deg around mandrel of radius = 1.5 t. Test on representative sample is also acceptable.

2.8 **Hardness test:-** (i) For SA 182 F91 :- 100% of fittings; Value: 191-250 BHN
(ii) For SA 182 F92 :- 100% of fittings; Value: 196-250 BHN
(iii) For other specn :- 10% of fittings; Value - As per specn.
The hardness test values shall be indicated in the Test certificate.

2.9 **MPI:-** All fittings shall be tested by MT as per ASTM E-709 and acceptance norm shall be as per ASME B 31.1 Clause 136.4.3

2.10 **Ultrasonic Test:-** Forgings of all thickness shall be ultrasonically tested as per SA 388 and acceptance norms shall be as per 3.3.4 of ASME Section VIII Division 2.

2.11 **Photomicrograph test for F91 & F92 :-** Photomicrograph test shall be carried out on one per heat, per size. Acceptance norms - The Material shall be free from any micro fissures. Microstructure shall show tempered martensite and also to be examined for any grain growth. Photomicrograph with 500x (Min) magnification along with Photomicrograph report to be provided. The actual magnification shall be indicated.

G.Venkataramani, Engg & Quality

G.Panneer Selvam, QA

Approved by

K. Vedaprasad, QC

K. Ganeshan, OPC&MPL



3.0 PIPES.

3.1 Material : SA 106 Gr.C, SA 335 P11, P12, P22 , P91 & P92 (Code case : 2179).

3.2 The pipes used shall meet the requirements indicated in Technical delivery condition ref. TDG: 101. The applicable / latest revision number of this document is indicated in the Tender / Purchase order.

4.0 FABRICATION OF Y Piece and Tees

4.1 Fit up, fabrication, dimension and tolerance shall be as per BHEL drawing.

4.2 Welding: WPS and PQR shall be approved by well known independent inspecting agencies like Lloyds, BV, SGS, Copy of approved WPS & PQR shall be furnished along with the Technical part of the bid for approval by BHEL.

4.2.1 Welding of F91 / P91 & F92 / P92 materials :

MATERIAL SPECIFICATION	ELECTRODES TO BE USED	
	GTAW PROCESS	SMAW PROCESS
SA F91 / P91	ER 90S – B9	E9015 – B9
SA F92 / P92	9Cr WV TIG	Thermanit MTS-616

GTAW rods and SMAW electrodes used shall be of following makes.

- Bohler Schweisstechnik Austria, Austria
- Bohler Thyssen Schweisstechnik, Germany
- Kobe Steels Ltd., Japan
- Oerlikon Welding Ltd, Switzerland
- Metrode Products, U.K

The core wire chemistry shall be equivalent to F91/ P91 & F92 / P92. Synthetic electrodes are not permitted.

4.3 PWHT for F91 / P91 & F92 / P92 materials shall be 760 ± 10 deg C. Holding time shall be minimum 2 hours for thickness up to 50mm; minimum 4 hours for thickness 51 to 100 mm. PWHT for other material shall be as per ASME B31.1.

5.0 NON DESTRUCTIVE EXAMINATION

5.1 All NDE shall be done after PWHT only – and witnessed by Inspection authorities.

5.2 NDE procedures (MT-Wet, PT, RT, UT and Hardness) shall be approved by BHEL.

5.3 All welds shall be subjected to RT, Wet MT and PT as per ASME Sec V. Evaluation and acceptance norms shall be as per ASME B31.1 Clause 136.4.5 for RT, Clause 136.4.3 for MT, Clause 136.4.4 for PT. Hardness shall be as per SA 234.

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G.Panneer Selvam, QA	K.Ganeshan, OPC&MPL	



5.4 All welds shall also be subjected to UT and its methodology and acceptance shall be as per AD 2000 Merkblatt HP 5/3-2002 Edition, with additional requirements as in 5.4.1 through 5.4.3 below.

5.4.1 The examination shall be conducted by Pulse Echo contact testing.
The following digital equipments or its equivalent models with A-scan presentation that generates and receives frequencies in the range of 1 MHz to 5 MHz. shall be used for examination: GE Inspection Technology (Krautkramer make), Olympus (EPOCH IV, XT), Sonatest (Master scan series-350M/380M) U.K.

The calibration blocks used shall be of same material specification, diameter & thickness.

The UT equipment shall be calibrated at the beginning of each period of extended use or every 3 months whichever is less.

5.4.2 All recordable indications will be stored in memory of either the digital flaw detector or a PC for review at a later period.

5.4.3 The equipment calibration data for specific weld as well as the hard copy of 'Static echo-trace pattern'– showing the flaw-echo amplitude with respect to DAC, flaw depth, projection surface distance (probe position) and beam-path shall be attached to UT test report. This hard-copy of echo-trace with equipment calibration data will form part of test documentation.

5.5 Qualified Level II personnel shall perform the examination as well as evaluation, and a test report shall be issued.

5.6 Hardness test shall be carried out and report to be furnished. The maximum hardness (HV 10) shall be 300 for F91 & F92 material; and 225 for F11, F12 & F22.

6.0 POSITIVE MATERIAL IDENTIFICATION (PMI) FOR ALLOY STEEL FITTINGS.

Each alloy steel fitting shall be checked for the correctness of the material during manufacturing and final inspection using X-ray fluorescence principle or spark emission spectrography.

7.0 WORKMANSHIP, FINISH AND REPAIR

All items shall have smooth, workman like finish, and to be free from scale & defects like laps, seams, folds, cracks, etc. Surface defects can be removed by mechanical means and defective areas smoothly dressed up with the adjacent surface. Minimum dimension after repair shall meet drawing / Specification. Repairs by fusion welding are prohibited.

8.0 PAINTING, COLOUR CODING, MARKING

8.1 **PAINTING:** All fittings shall be painted on the external surface as given below

a) Surface preparation: Blast cleaning

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G.Panneer Selvam, QA		K. Ganeshan, OPC&MPL



b) Painting: Seaworthy Epoxy painting of DFT – 100 microns with colour shades as given below.

c) Shade: (i) Smoke grey -- for all carbon steel fittings.
(ii) Sea green -- for all Alloy steel fittings.

The internal surface shall be protected with rust preventive coating or rust inhibitor.

8.2 COLOUR CODING: All fittings shall be colour coded circumferentially at ends as given below:-

SA 105 / SA 106 Gr.C	=	Blue
SA 182 F11 / SA 335 P11	=	Green & White
SA 182 F12 / SA 335 P12	=	Black & Red
SA 182 F22 / SA 335 P22	=	Blue & Red
SA 182 F91 / SA 335 P91	=	Brown & Red
SA 182 F92 / SA 335 P92	=	Brown & Blue

8.3 MARKING (In English only):-

8.3.1 The fittings dispatched to **BHEL Stores** shall be hard punched / etched with Material code, Heat number, material specification, maker's emblem, Inspectors seal and Statutory authorities seal (as applicable).

In addition, the above details along with size shall be paint stencilled on the fittings.

8.3.2 The fittings dispatched directly to project site as **DTS** shall be hard punched and paint Stencilled with DU code (14 digit work order du detail) as given by purchase in addition to marking done as per para 8.3.1.

9.0 PACKING AND END PROTECTION: Machined ends of the fittings shall be well protected using end caps and fittings shall be suitably packed in box / crate to avoid transit & other damages.

10.0 MANUFACTURING QUALITY PLAN.

Vendor shall submit manufacturing Quality plan along with technical part of the bid for BHEL approval.

11.0 INSPECTION & CERTIFICATION (In English only):-

11.1 All items are to be inspected at the manufacturer's works by the Inspection agencies / authorities as per IBR. Inspection certificate for finished product in IBR Form IIIC shall be submitted along with the Work Test Certificate (EN 10204 Type 3.2) countersigned by authorities as per IBR and shall include the following details. (Three ink signed originals required)

- Test Certificate Number & date.
- BHEL P.O Number & Amendment Number(if any)
- BHEL P.O. Serial Number
- BHEL TDC Number, Drawing number
- Size-wise Quantity

G.Venkataramani, Engg&Quality

Approved by

K. Vedaprasad, QC

G.Panneer Selvam, QA

K. Sanesthan, OPC&MPL



- vi. Specification, Grade & Year of code.
- vii. Heat / Melt Number
- viii. Steel making process.
- ix. Material details
- x. Ladle and product Analysis of Raw Material.
- xi. Tensile Test
- xii. Bend Test
- xiii. Guarantee of HTP shall be given in the test certificate as follows, if hydro test is not carried out: - "Fabricated Y piece / welded Tees are capable of withstanding without failure, breakage or impairment of their serviceability a hydrostatic test pressure equal to that prescribed for the specified matching pipe of equivalent material".
- xiv. References to the NDT & other test reports covered in 11.2 below.

11.2 The following reports shall be **furnished separately** along with the Form III C & MTC indicated in para 11.1 above.

- i. NDE reports for VT, MT, RT, UT (UT Reports in soft copy + hard copy).
- ii. Positive Material identification (PMI) report for Alloy steel.
- iii. Heat Treatment Chart.
- iv. Hardness Test report.
- v. Photomicrograph test report along with photomicrograph with minimum 500 x magnifications.
- vi. Dimensional report (as built drawing with dimensions)

12.0 RECORDS OF REVISION.

- Revision 01 : a) Para 3.0, 4.2.1 ,6.0 , 10.0 are included.
b) Para 1.0,4.2,4.3,8.2,11.0 are revised.
- Revision 02 : a) Para 2.10,4.2.1,8.1, 8.2, 9.0 are revised.
- Revision 03 : a) Para 2.12, 8.0 and 11.0 (18) are revised.
- Revision 04 : a) Para 8.1 modified as sea worthy painting.
b) Para 11 modified. Works TC 'EN 10204 Type 3.2' specified. Individual reports are required.
- Revision 05 : a) Para 5.6 (Hardness test) included.
b) Para 8.1 modified indicating colour shades.
c) Para 11 modified for better clarity with respect to documentation.
- Revision 06 : a) New material specn. SA 182 F92 & SA 335 P92 are included.
b) Para 2.1, 2.3, 2.4.1, 2.4.2, 2.8, 2.11, 3.1, 4.2.1, 4.3, 5.6, 8.2, 11.2(vi) are revised.
c) Para 2.5, 2.6, 2.7, 2.9 & 2.10 are modified for better clarity.

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1.0 CODES

Materials shall meet Indian Boiler Regulations, (IBR) in addition to the latest Version of SA105, SA 182 & Code Case 2179 (for SA182 F92) as on date specified in the Purchase Order (PO).

2.0 RAW MATERIAL

- (a) The raw material used shall meet the respective specification and the test certificate shall be furnished.
- (b) Steel for SA 182 F11, F12 & F22 if indigenously procured, to be procured from following manufacturers i) Alloy Steel Plant , Durgapur, ii) Tata Iron & Steel company, Jamshedpur & iii) Mahindra Ugine Steel Company , Mumbai, who are approved by IBR for creep resistant steels.
- (c) Carbon content of Carbon steel fittings (SA 105) shall be restricted to 0.25% max

3.0 PROCESS

- (a) Process of manufacture shall conform to applicable standards.
- (b) Unless otherwise specified in the P.O, SA182 F11/12 fittings shall be supplied as per class 2 and SA182 F22 shall be of Class 3 only.
- (c) Dimensions shall be as per Purchase Order.

4.0 HEAT TREATMENT

4.1 All fittings shall be heat treated as below:

- SA 105 - Normalised
- SA 182 F11/F12/ F22 - Normalised & Tempered

4.2 Fittings conforming to SA182 F91 & F92 shall be normalised at 1040 to 1070 deg C (for wall thickness larger than 75 mm, accelerated cooling may be done to obtain a fully martensitic structure) and tempered at 760±10 deg C. Soaking time: 1Hr. minimum. Still air cooling.

5.0 TESTING

- (a) **Product analysis:-** Product analysis shall be carried out on One piece / Heat / HT lot / Size.
- (b) **Corrosion test:-** Corrosion test (IGC) shall be carried out on one piece / Heat / HT lot / Size for SS fittings.
- (c) **MPI / LPI:-** All CS & AS items shall be tested by MPI as per ASTM E-709 & SS items by LPI as per E 165.
- (d) **Tension test:-** Tension test shall be carried out on one Test piece for each specification, heat, heat treatment lot and size.
- (e) **Bend test:-** (a) Bend test for CS (SA 105) : One sample of 19 mm thick and 25mm width to be bent 180 deg around mandrel of radius 6.35mm.
(b) Bend test for AS (SA182): One Sample of 25.4 mm width and thickness = t to be bent 180 deg around mandrel of radius = 1.5 t. Test on representative sample is also acceptable.


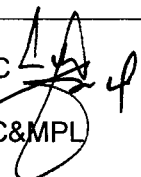
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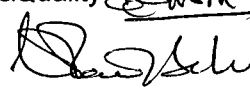
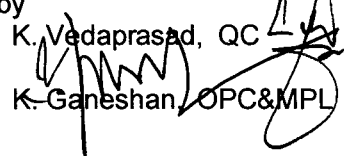
G.Venkataramani, Engg&Quality		K. Vedaprasad, QC	
G.Panneer Selvam, QA		K. Ganeshan, OPC&MPL	



- (f) **Photomicrograph test for F91 & F92** :- Photomicrograph test shall be carried out on one per heat, per size. Acceptance norms - The Material shall be free from any micro fissures. Microstructure shall show tempered martensite and also to be examined for any grain growth. Photomicrograph with 500x (Min) magnification along with Photomicrograph report to be provided. The actual magnification shall be indicated.
- (g) **Hardness test**:- (i) For SA 182 F91 :- 100% of fittings; Value: 191-250 BHN
(ii) For SA 182 F92 :- 100% of fittings; Value: 196-250 BHN
(iii) For other specn :- 10% of fittings; Value - As per specn.
The hardness test values shall be indicated in the Test certificate.
- (h) **Ultrasonic Test**:- All items shall be ultrasonically tested as per SA388 and acceptance norms shall be as per 3.3.4 of ASME Sec VIII Div .2
- 6.0 POSITIVE MATERIAL IDENTIFICATION (PMI) FOR ALLOY STEEL FITTINGS.**
Each alloy steel fitting shall be checked for the correctness of the material during manufacturing and final inspection using X-ray fluorescence principle or spark emission spectrography.
- 7.0 WORKMANSHIP, FINISH AND REPAIR**
All items shall have smooth, workman like finish, and to be free from scale & defects like laps, seams, folds, cracks, etc. Surface defects can be removed by mechanical means and defective areas smoothly dressed up with the adjacent surface. Minimum dimension after repair shall meet drawing / Specification. Repairs by fusion welding are prohibited.
- 8.0 PAINTING, COLOUR CODING, MARKING, PACKING & END PROTECTION**
- 8.1 **PAINTING**: All fittings except SS to be applied with resin type rust preventive coating with visibility to punched and stenciled details on outside and either with rust preventive coating or rust inhibitor inside. SS fittings to be surface treated as per ASTM A380 both inside and outside.
- 8.2 **COLOUR CODING**: All fittings shall be colour coded circumferentially at ends as given below.
- | | | |
|------------|---|---------------|
| SA105 | = | Blue |
| SA182 F11 | = | Green & White |
| SA182 F12 | = | Black & Red |
| SA182 F22 | = | Blue & Red |
| SA182 F91 | = | Brown & Red |
| SA182 F92 | = | Brown & Blue |
| SA182 F316 | = | Black & Blue |
- 8.3 **MARKING** (In English only) :-
- 8.3.1 The fittings dispatched to **BHEL Stores** shall be hard punched / etched with Material code, Heat number, material specification, maker's emblem, Inspectors seal and Statutory authorities seal (as applicable).
In addition, the above details along with size shall be paint stencilled on the fittings.

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8.3.2 The fittings dispatched directly to project site as DTS shall be hard punched and paint stencilled with DU code (14 digit work order du detail) as given by purchase in addition to marking done as per para 8.3.1.

8.4 **PACKING AND END PROTECTION:** Machined ends of the fittings shall be well protected using end caps and fittings shall be suitably packed in box / crate to avoid transit & other damages.

9.0 INSPECTION & CERTIFICATION (In English only) :-

All items are to be inspected at the manufacturer's works by the Inspection agencies / authorities as per IBR and as indicated in the P.O. Inspection certificate in IBR Form IIC (for items under IBR purview) shall be submitted along with the Work Test Certificate countersigned by any of the above authorities and shall include the following.

1. Test Certificate Number & date.
2. BHEL P.O Number & Amendment Number(if any)
3. BHEL P.O. Serial Number
4. BHEL TDC Number
5. Size-wise Quantity
6. Specification, Grade & Year of code.
7. Heat/Melt Number
8. Steel making / forming process
9. Ladle and product Analysis of Raw Material.
- *10. Product analysis report.
- *11. Heat Treatment Chart.
- *12. NDE report. (VISUAL.MPI, LPI, UT)
- *13. Tensile Test report
- *14. Bend Test report.
- *15. Hardness Test report
- *16. Intergranular corrosion test report for SS
17. Photomicrograph test report along with photomicrograph with 500x (min) magnification.
- *18. Dimensional conformance.
- *19. Starting material details.
- *20. Guarantee of HTP shall be given in the test certificate as follows if hydro test is not carried out :- "Forgings are capable of with standing without failure, breakage or impairment of their serviceability a hydrostatic test pressure equal to that prescribed for the specified matching pipe of equivalent material".

*Details furnished in the Test certificate in lieu of chart/report is acceptable.

10.0 Records of Revisions:-

Revision 02 : Material specification SA 182 F316 added.

Revision 03 : i) Para 4.0, 6.0 included.

ii) Para 5.0 (b),(c),(h),(j), 8.0 and 9.0 (17) are revised.

Revision 04 : i) New material specification SA 182 F92 added.

ii) Para 1.0, 3.0, 4.2, 5 (f), (g) & 8.2 are revised.

iii) Para 5 (a) to (h) are modified for better clarity.

Approved by

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G.Panneer Selvam, QA		K. Ganeshan, OPC&MPL	



1.0 GENERAL

Materials: SA106GrB, GrC; SA 335 P11, P12, P22, P91 & P92(Code case : 2179).

This Technical Delivery Condition specify the requirements in addition to ASME SA 106, SA 335. If the blooms for SA 335 pipes are sourced from India, then the sources shall be, TISCO, MUSCO and ASP Durgapur - which are IBR approved.

2.0 CHEMICAL COMPOSITION

For SA106 Gr B and Gr C :- Carbon content shall be limited to 0.25% max. for pipe thickness up to and including 20 mm; and 0.30% max. for pipe thickness above 20 mm.

For SA335 P92 : Si: 0.10-0.50%; Ni: 0.30max and Cu: 0.25max.

3.0 TOLERANCES

3.1 OD specified pipes:- Unless otherwise specified in the PO, tolerances shall be as below.

- Outside diameter : $\pm 1\%$ (Max. 4 mm)
- Wall thickness and weight tolerance as per ASTM A530 for Carbon steel and ASTM A999 for Alloy steel pipes

3.2 ID specified pipes are specified by the maximum Internal Diameter and Minimum wall thickness. The tolerance if not specified otherwise in the PO shall be:

- ID: +0.0mm, -3.2mm
- Thickness: +6.4mm, -0.0mm
- Weight per metre : +10% , -5% on nominal weight **

** Nominal weight of ID Pipe per metre shall be calculated as follows,
 $W_{tnom} = (ID_{nom} + t_{nom}) * t_{nom} * 0.02466$ kg/metre , where
ID nom = IDmax-1.6 mm ; tnom = tmin+3.2 mm

4.0 HEAT TREATMENT & MECHANICAL TESTS

4.1 HEAT TREATMENT

Heat treatment for SA106 GrB, GrC , SA335 P11,P12, P22 shall be as per specification.

SA 335 P91 & P92 pipes shall be normalised at 1050 to1080deg C (for wall thickness larger than 75 mm, accelerated cooling may be done to obtain a fully martensitic structure) and tempered at 750 to 780 deg C. Soaking time 1 hour minimum, still air cooling.

4.2 MECHANICAL TESTS

- a) Number of Test (as per IBR): 2 numbers up to first 100 pipes and additional 1 number per subsequent 100 pipes or part thereof.
 - b) For P91 Pipes, Ys(0.2% offset) - 450 MPa min ; Ts – Min 630 MPa, Max 850 MPa.
 - c) For P92 pipes Ts- Min 655 Mpa, Max 850 Mpa
- For other grades, Ys and Ts shall be as per specifications.

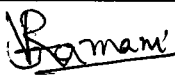
5.0 SUPPLEMENTARY TESTS

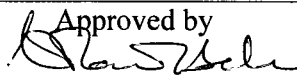
These are applicable to SA 106 Cr C, SA335 P11, P12, P22, P91 & P92. The supplementary test results shall be indicated in the Test Certificate along with the mandatory test results.

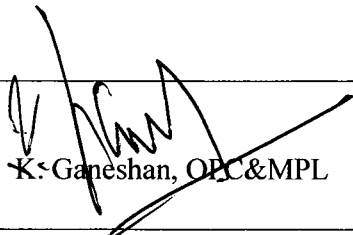
- 5.1 **Product Analysis (S1)** :- Product Analysis shall be carried out on 5% of pipes per lot per heat (minimum 2 Nos)
- 5.2 **Transverse tension test (S2)** :- Transverse tension test shall be carried out (for size NB 200 mm and above) on one end of 5% of pipes per lot (minimum 1 No).
- 5.3 **Photomicrograph test for P91 & P92 (S5)** :- Photomicrograph test shall be carried out on one per heat, per size. Acceptance norms - The Material shall be free from any micro fissures. Microstructure shall show tempered martensite and also to be examined for any grain growth. Photomicrograph with 500x (Min) magnification along with Photomicrograph report to be provided. The actual magnification shall be indicated.

6.0 HARDNESS FOR SA 335 P91 & P92 PIPES

Hardness test shall be carried out on each SA 335 P91 & P92 pipes. The hardness value for P91 shall be 191-250 BHN and that for P92 shall be 196-250 BHN. The hardness test values shall be indicated in the Test certificate.


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7.0 NON DESTRUCTIVE TEST

Each pipe shall be ultrasonically tested as per ASTM E 213 in both clockwise & anticlockwise directions; calibration to be done on two axial notches of 50 mm length (inside & outside) and a depth of 5% of wall thickness (minimum 0.3 mm; maximum 1.5mm). The results shall be indicated in the Test Certificate.

8.0 REPAIR

Repair by welding is prohibited. The pipe shall meet the dimensional tolerance (clause 3.0 above) after any mechanical repair as permitted in the standard.

9.0 WORKMANSHIP

All pipes shall have smooth surfaces, free from loose scales and defects like laps, seams, folds, cracks, pitting etc. The surface imperfection beyond the permissible limit of ASME SA106 / SA335 shall be removed mechanically without affecting the minimum thickness and workmanlike finish.

10.0 MARKING

The following details are to be marked on the consignment for identification

- 1) PO Number 2) Supplier's emblem/code 3) Specification & grade 4) Heat number
5) Size 6) No. of pipes 7) Inspector's seal

OD up to 31.8 mm (excluding)	Details 1 to 7 shall be stamped on metal / plastic tag attached to bundle
OD 31.8 mm to OD 76.1 mm (including)	<ul style="list-style-type: none">• Details 1 to 5 shall be paint stencilled on each pipe.• Details 1 to 7 to be stamped on Metal / Plastic tag attached to bundle.
OD above 76.1 mm	<ul style="list-style-type: none">• Details 2,3,4,5 & 7 shall be hard stamped with round edged stamp at 100mm from an end of each pipe.• Details 1 to 5 shall be paint stencilled on each pipe.

11.0 COLOUR CODING

Longitudinal colour bands shall be made throughout the length of the pipe. The colours shall be as per BHEL procedure SIP: PP: 21(Latest).

12.0 PRESERVATION

- Outside:- Resin type rust preventive coating with visibility to stencilled details.
- Inside:- Rust inhibitor or resin type rust preventive coating.
- Ends of the pipes shall be secured with caps.

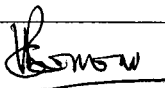
13.0 INSPECTION AND CERTIFICATION

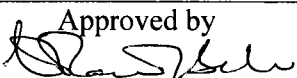
- 13.1 Pipes shall be inspected at the manufacturer's works by the IBR approved Inspecting Authority. Inspection certificate in IBR Form III A (Well-known pipe maker recognised in IBR to submit IBR FORM III D) along with Mill Test certificate and NDT reports certified by IBR approved Inspecting Authority shall be submitted.
- 13.2 Test Certificate shall include PO no.(BHEL) , TDC no., Pipe size and quantity- melt wise, specification and grade with year of code, Heat no., Steel & Pipe making process, chemistry including incidental elements on Ladle and Product analysis, Heat treatment details with actual temperature and soaking time, Mechanical results.
- 13.3 Detailed NDT reports with reference norms, acceptance standards and test results shall be furnished along with Test certificates.
- 13.4 For P91 & P92 pipes the Photomicrograph test report along with photomicrograph with 500x (min) magnification shall be furnished

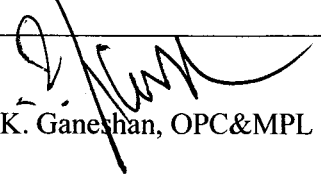
14.0 RECORDS OF REVISIONS

- (i) Rev 03 – Para 4.1, 4.2.b are included; Para 6.0, 13.0 are modified
(ii) Rev 04 – Para 3.1, 3.2 modified
(iii) Rev 05 – SA335 P92 included. Para 1.0, 2.0, 4.1, 4.2, 5.0, 6.0 are modified & Para 5.3, 13.4 included.

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K. Ganeshan, OPC&MPL

List of Consortium Bank

Nationalised Bank		Nationalised Bank	
1	Allahabad bank	19	Vijaya Bank
2	Andhra bank		Public Sector Banks
3	Bank of Baroda	20	IDBI
4	Canara Bank		Foreign bank
5	Corporation bank	21	CITI Bank N.A
6	Central bank	22	Deutsche Bank AG
7	Indian Bank	23	The Hongkong and Shanghai Banking Corporation Limited
8	Indian Oversea Bank	24	Standard Chartered Bank
9	Oriental bank of Commerce	25	The Royal Bank of Scotland N.V.
10	Punjab National Bank	26	J P Morgan
11	Punjab & Sindh Bank		Private bank
12	State Bank of India	27	Axis Bank
13	State Bank of Hyderabad	28	The Federal Bank Limited
14	Syndicate Bank	29	HDFC
15	State Bank of Travancore	30	Kotak Mahindra Bank
16	UCO Bank	31	ICICI
17	Union Bank of India	32	Indusind Bank
18	United Bank of India	33	Yes Bank

(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT AND THE EXPIRY DATE OF BG MUST BE AFTER 60 DAYS FROM THE DATE OF COMPLETION OF WARRANTY PERIOD)

PERFORMANCE BANK GUARANTEE

In accordance of M/s. Bharat Heavy Electricals Limited (A Government of India undertaking, a company incorporated under the Companies Act 1956 having its Registered Office at “BHEL House”, SIRI Fort, New Delhi 110 049) through its Piping Centre, 80 G.N.Road, T.Nagar, Chennai – 17. (hereinafter called ‘the Company’) having entered into a contract withhereinafter called ‘ the said contractor ‘ which term includes ‘suppliers’ for the purpose of this Bond and under the terms and conditions of the contract No..... Dt Between BHEL, Trichy and as per the contract, the contractor / supplier is to furnish a performance Bank guarantee for Rs. for the due performance of the equipment to be supplied under the above referred contract and for the fulfillment of all the terms and conditions of the contract, We(indicate the name of the bank) (herein after referred to as the bank) at the request of (Contractor(s)) do here by undertake to pay the company an amount not exceeding Rs.....against any loss or damage caused to or suffered or would be caused to or suffered by the company by reason of any breach by the said contractor (s) of any of the terms and conditions contained in the said agreement.

2. We(indicate the name of the bank with full address), do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Company stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Company by reason of breach by the said Contractor(s) of any of the terms and conditions contained in the said Agreement or by the reason of the contractor(s) ‘failure to perform’ the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs._____.

3. We undertake to pay unconditionally to the Company any money so demanded notwithstanding any dispute(s) raised by the Contractor in any suit, or proceedings pending before any Court or Tribunal or Arbitration or before any other authority relating thereto our liability under this present being absolute and unequivocal. The payment under this guarantee would not wait till the disputes have been decided by any Court or Tribunal or in the arbitration proceedings or by any other authority. The payment so made by us under this Bond shall be a valid discharge of liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.

4. We.....(indicate the name of Bank), further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the Company under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till _____Office / Department/ Division of the Company certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.

5. (I) Unless a demand or claim under this guarantee is made on us in writing on or before the _____ we shall be discharged from all the liability under this guarantee thereafter. But where such claim or demand has been preferred by the Company with the Bank before the expiry of the said date, the claim shall be enforceable notwithstanding the fact that the said enforcement is effected after the said date.

(ii) For the purpose of this clause, any letter making demand on the Bank by M/s. BHEL dispatched by Registered Post with Ack.Due or by Telegram or by any Electronic media addressed to the above mentioned address of the Bank shall be deemed to be the claim / demand in writing referred to above irrespective of the fact as to whether and when the said letter reaches the Bank, as also any letter containing the said demand or claim is lodged with the bank personally.

6. We(indicate the name of Bank), further agree with the company that the Company shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor (s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Company against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by any reason of any such variation or extension being granted to the said Contractor(s) or for any forbearance, act or omission on the part of the company or any indulgence by the company to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating would, but for this provision, have effect of not so relieving us.

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

8. It shall not be necessary for the company to proceed against the contractor before proceeding against the guarantor-bank and the guarantee herein contained shall be enforceable against them notwithstanding any security, which the company may have obtained or obtain from the Contractor shall, at the time when proceedings are taken against the guarantor hereunder be outstanding or unrealised.

9. Any claim or dispute arising under the terms of this document shall only be enforced or settled in the Courts at Tiruchirapalli.

10. The guarantor hereby declare that it has power to execute this guarantee and the executant has full powers to do so on its behalf under the proper authorities granted to him/them by the guarantor.

11. We(indicate the name of Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the company in writing.

In witness whereof we....., (indicate the name of Bank) have hereunto setout Bank Seal the _____ day _____ month 200

BANK E-MAIL ID:
BANK PHONE NO.
BANK FAX NO: