



1.0 GENERAL

Materials: SA 106GrB, Gr C; SA 335 P11, P12, P22, P91 & P92 (Code case: 2179).

This Technical Delivery Condition specifies the requirements in addition to ASME SA 106, SA 335.

2.0 CHEMICAL COMPOSITION

Ladle Analysis : SA 106 Gr B:- Carbon content shall be 0.25% max.

SA 106 Gr C:- Carbon content shall be limited to 0.25% max, for pipe thickness ≤ 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.

2.1 The raw material steel for Pipe (Billet/Bloom) shall conform to the chemical and process requirements of respective Pipe specification.

2.2 The raw material steel for Pipe (Billet/Bloom) shall be sourced from IBR well-known steel makers.

2.3 The raw material Steel for Pipe (Billet/Bloom) to be inspected at Mill & test certificate countersigned by IBR approved Authority, if the mill is not approved under IBR as well-known steel maker.

3.0 TOLERANCES

Unless otherwise specified in the PO, tolerances shall be as below:

3.1 OD specified pipes:-

SA335 P91 & P92: the tolerance on OD shall be: $\pm 1\%$ (Max: 4mm) of Nominal OD.

Other than SA335 P91 & P92: the tolerance on OD shall be: $\pm 1\%$ (Max: 6mm) of Nominal OD.

3.2 ID specified pipes are specified by the maximum Internal Diameter and Minimum wall thickness. The tolerance if not specified 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,

$W_{nom} = (ID_{nom} + t_{nom}) * t_{nom} * 0.02466$ kg/metre , where

$ID_{nom} = ID_{max} - 1.6$ mm ; $t_{nom} = t_{min} + 3.2$ mm

Actual weight per metre shall be indicated in mill test certificate.

4.0 STRAIGHTNESS & POLYGONIZATION

The Pipes shall not deviate from straightness by more than 1mm in any one meter and shall not be more than 6mm over the entire length for Pipes of OD > 76.1 mm. A sharp bend at the end or kink and twist are not acceptable. These limitations are applicable for any given plane.

Also, for Pipes with OD ≤ 76.1 mm, shall be made by processes specified below:

- All pipes shall be cold formed in case of "t/D" ratios > 0.15 , where "t" is the specified nominal wall thickness and "D" is the specified nominal OD of the pipe.
- Pipes may be cold formed or hot formed in case of "t/D" ratios upto and including 0.15.
- The degree of polygonization (P), measured as indicated in Fig.1 & calculated using the below formula, shall not exceed 15% in both the above cases:

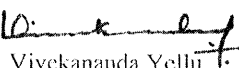



$$P = \{[\sum SB - \sum SA] / [0.135 * (3D - \sum SA)]\} * 100$$

where, P is the degree of Polygonization in %

D is the specified nominal OD of the pipe

$\sum SB$ is the sum of maximum pipe wall thicknesses measured at 6 locations 60 degrees apart and

$\sum SA$ is the sum of minimum pipe wall thicknesses measured at 6 locations 60 degrees apart.

 Vivekananda Yellu Dy.Mgr/QA	 K. Rajitha SDGM/MM	 C. Karunakaran AGM/Engg	 A.P. Madhavan Kuttu AGM/Quality
Prepared By	Reviewed By		Approved By



Wall thickness shall be measured using profile projector/shadowgraph/digital scanner/any other suitable instrument meant for this purpose.

Definition of the measure points:

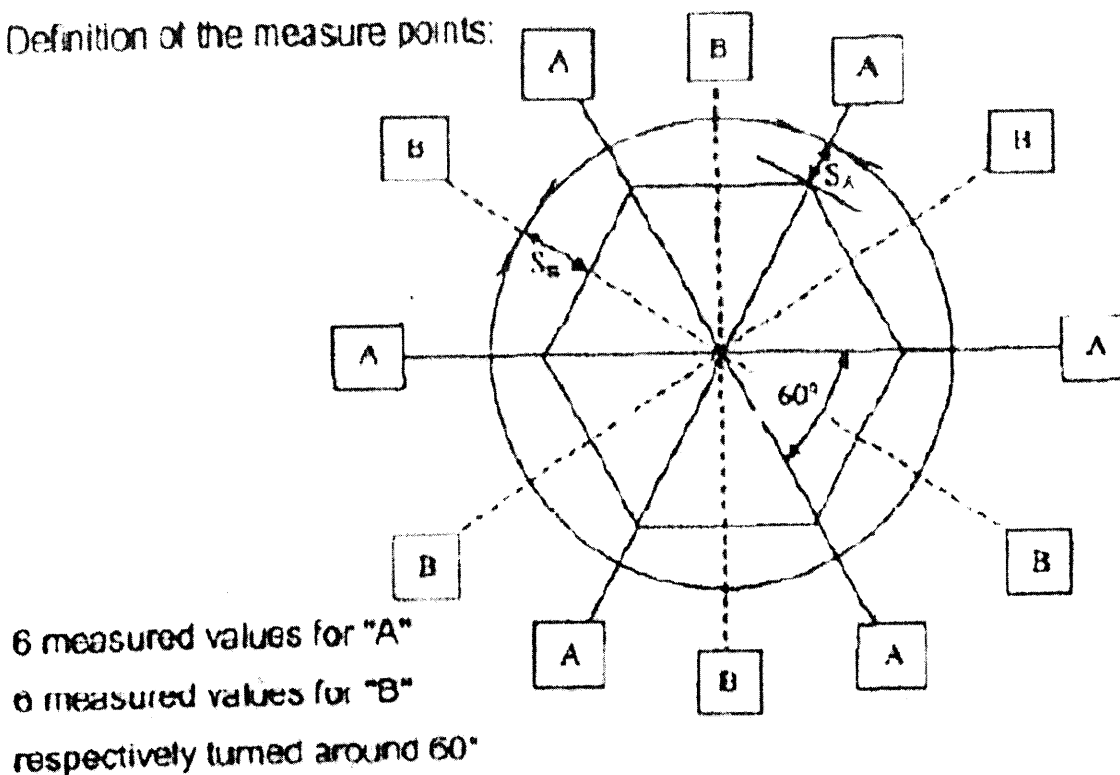


Fig. 1

5.0 HEAT TREATMENT & MECHANICAL TESTS

5.1 HEAT TREATMENT

CS: Hot Finished : OD \leq 76.1mm no heat treatment required. OD > 76.1mm shall be in Normalised condition.

CS: Cold Finished : All Sizes – In Sub-critical annealed, fully annealed or in Normalised condition.

AS: All sizes – SA335 P11, P12 & P22 – Either in Normalised and tempered or Isothermal Annealed condition.

AS: All sizes – SA335 P91 & P92: Shall be Normalised as per specification & Tempered between 750°C-780°C.

5.2 MECHANICAL TESTS:

As per specification. Quantum of test: As per specification – For each nominal size per heat per heat treatment batch. (Minimum 2 pipes for first 100 pipes and 1 per 100 or part thereof for pipes over 100 numbers, as per IBR). For alloy steel pipes meant for fitting (As indicated in the Purchase order), test coupon shall be in normalised and tempered condition.

For P91 Pipes, Ys (0.2% offset) - 450 MPa Min ; Ts – Min 630 MPa, Max 850 MPa.

For P92 pipes Ts- Min 630 Mpa, Max 850 Mpa.

For other grades, Ys and Ts shall be as per specifications.

5.3 HARDNESS FOR SA 335 P91 & P92 PIPES :

Hardness test shall be carried out on each pipe. The hardness value for P91 shall be 195-250 BHIN and that for P92 shall be 190-250 BHN. The hardness test values shall be indicated in the Test certificate

 Vivekananda Yellu Dy.Mgr/QA	 K. Rajitha SDGM/MM	 C. Karunakaran AGM/Engg	 A.P. Madhavan Kuty AGM/Quality
Prepared By	Reviewed By		Approved By



6.0 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.

6.1. **Product Analysis (S1):-** Product Analysis shall be carried out on 5% of pipes per heat per heat treatment batch (minimum 2 Nos) for size NB 200 mm and above.

6.2. **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 heat per heat treatment batch (minimum 1 No).

6.3. **Photomicrograph test for P91 & P92 (S5):-** Photomicrograph test shall be carried out from a specimen of pipe in the as finished condition for each individual size (OD and wall thickness) per heat per heat treatment batch. 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 and delta ferrite (to be maintained within 3% for Gr92 and within 2% for Gr91 when measured as per VD TUV 1272). Photomicrograph with 400x (Min) magnification along with Photomicrograph report to be provided. The actual magnification shall be indicated.

6.4. **Project specific requirement for any other supplementary test as indicated in respective material specification shall be addressed separately in Enquiry / Purchase order.**

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

The Inside & outside surfaces of the pipes shall be free from any imperfections & defects like laps, seams, folds, cracks, pitting etc., Localised imperfections, if any, may be removed by grinding or skin machining only, ensuring the wall thickness, inside and outside diameter to provide workmanship like finish. Local depressions or ground spots are not acceptable. Loose scales shall be removed by blast cleaning in both inside and outside surface.

10.0 MARKING & COLOUR CODING

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

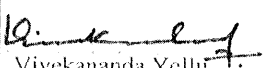
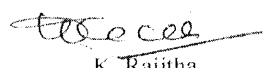

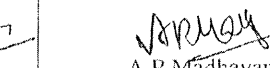
- 1) PO Number 2) Supplier's emblem/code 3) Specification & grade (Code Case if applicable) 4) Heat number
5) Size (OD/ID X Thickness X Length, in mm) 6) No. of pipes 7) Inspector's seal

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 76.1mm (including)	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	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.

Longitudinal colour bands on the entire length of all pipes. The colours shall be as per BHEL procedure SIP: PP: 21(Latest).

11.0 PRESERVATION

- Outside: - Resin type rust preventive coating with visibility to stencilled details. Thick Black coating which camouflages the Surface of the pipes is not permitted.
- Inside: - Rust inhibitor or resin type rust preventive coating.
- Ends of the pipes shall be secured with caps.

 Vivekananda Yellu Dy.Mgr/QA	 K. Rajitha SDGM/MM	 C. Karunakaran AGM/Engg	 A.P. Madhavan Kutty AGM/Quality
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12.0 PACKING

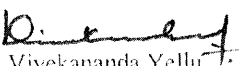


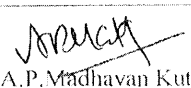
- a) Thickness ≤ 2.5 mm in boxes. b) OD ≤ 159 mm in bundles. Others in loose condition.
Pipe bundles to be ≤ 4 tons of equal no. of pipes, fastened with galvanised strap/ anti-rust coated (1x25mm.min.) for Carbon Steel & Alloy Steel and by Nylon strap for Stainless Steel at 2 ends & at 1m interval. Wooden pallets to cover pipes are not permitted.

13.0 INSPECTION AND CERTIFICATION (In English Only)

- 13.1. Products shall be inspected at works and the applicable IBR Forms must be Countersigned by the Inspecting Authority as indicated below:
a) **Imported Items:** Inspecting Authority approved by IBR for the Country of origin (To be concurred by BHEL before placing PO).
b) **Indigenously Supplied items:** Director/Chief Inspector of Boilers of respective State.
13.2. Certification in IBR Form-III A for Pipes & IBR Form-IV for the raw material steel from "IBR-Well Known Pipe Maker" or "Inspecting Authority" as applicable, to be submitted.
13.3. 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.
13.4. Detailed NDT reports with reference norms, acceptance standards and test results shall be furnished along with Test certificates.
13.5. For P91 & P92 pipes the Photomicrograph test report along with photomicrograph with 400x (min) magnification shall be furnished.
13.6. Refer to BHEL Engineering Drawing: 4-03-000-00062 (Latest Rev) for MAWP values for various material grades & sizes at various temperatures.

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.
iv) Rev 06 – Para 4.0 added. Para 1.0, 3.1, 3.2, 4.1, 5.1, 5.2, 6.1, 6.2, 6.3, 9.0, 10.0, 11.0 & 12.1 revised and further Clauses renumbered.
v) Rev 07 – Para 3.2 revised w.r.t. thickness tolerance for ID specified pipes.
vi) Rev 08 – Para 12.0 added and further clauses renumbered.
Para 5.2, 5.3 & 6.3 revised.
Para 13.1 & 13.2 are revised as per IBR amendment dt :15-Apr-2015.
vii) Rev 09 – Para 3.1 & 5.1 revised.
viii) Rev 10 – Para 2.1, 2.2, 2.3, 4.0 (Polygonization), 5.4(Creep Test), 6.4, 13.6 & 13.7 added.
Para 9.0, 10.0 & 13.2 revised
ix) Rev 11 – Para 5.4 & 13.6 - Creep Test requirements removed and further clauses renumbered.

 Vivekananda Yellu Dy.Mgr/QA	 K. Rajitha SDGM/MM	 C. Karunakaran AGM/Engg	 A.P. Madhavan Kutty AGM/Quality
Prepared By	Reviewed By		Approved By



Product: Seamless Steel Pipes (for Boiler And Piping)

Record of Revision:

Rev 09: 15/02/03: Cl.3.0 revised

Rev 10: 27/01/04 Cl.8 Hydraulic test removed, further clauses renumbered. Annexures introduced for Cl.11. In Cl.2 limits for carbon in Gr C modified. In Cl. 4 normalizing made mandatory for all pipes of Gr C & Gr B meant for fitting. In Cl.5.0 test coupon for pipes meant for fittings removed.

Rev 11: 29/12/07 Cl 1, P92 included. P2, P5, P9, 304L, 321 Deleted. Cl.4, 10, 11, modified.

Rev 12: 29/07/10 Cl 1, P91, P92 Deleted and included in TDC 0123; Cl: 4, 5, 7, 8, 10, 11 modified.

Rev 13: 26/10/12 Cl 2, 6 & 11 modified for SS material

Rev 14: 29/12/12 Cl 4 – Heat treatment for CS modified. Cl 6 – corrected.

Rev 15: 28/11/13 TDC 123 Rev 00 and TDG 32 Rev 03 merged with TDC 101 Rev 15 & Product description modified. Cl 3 added. Cl 5, Cl 8, Cl 12 modified. SA335 Gr 91, 92 included (Cl 1) and subsequent dimensional tolerance (Cl 3), heat treatment (Cl 5), mechanical testing (Cl 6), and photomicrograph (Cl 7 iii) added. SA335 Gr 23 removed from TDC 123 Rev 00

Rev 16: Cl 3– OD & ID tolerance revised, Cl 5– temperature for Gr 91, 92 modified, Cl 6 – mechanical test values changed in-line with ALSTOM purchase specification, Cl 7 – PMI magnification & frequency clarified, Cl 9 & 11 – modified, Cl 12– changed as per latest IBR.

Rev 17: Dt: 13/10/2017: Cl 1 modified; Cl 4 modified to include finishing process and polygonization requirements for pipes of OD ≤ 76.1; Cl 5 modified; Cl 6(c) added to include creep requirements; Cl 8 & 9 modified; Cl 12– changed as per latest IBR to include MAWP requirements and IBR Form IV.

Rev. 18: Dt: 11/11/2017: Cl. 6(c), Cl.12.3 (vii)-creep requirements removed.

1. MATERIAL:

Specification	:	ASME (Latest as on the date of <i>Enquiry/PO, whichever is earlier</i>):
Carbon Steel (CS)	:	SA106 Gr B & C
Alloy Steel (AS)	:	SA 335 Gr P11, P12, P22, P91 & P92 (Code Case: 2179)
Stainless Steel (SS)	:	SA 312 Gr TP 316, TP 316L
Additional requirement	:	As listed below (Supplementary to <i>above material</i> specifications).
Pipe Size and Qty	:	As per <i>Purchase Order</i>

The billet/bloom shall conform to the chemical and process requirements of respective pipe specifications. The billet/bloom shall be sourced from IBR well-known steel makers or with inspection and certification by IBR authorized Inspecting Authority.

2. CHEMICAL COMPOSITION:

2.1 Ladle and Product Analysis:	SA 106 Gr B:	Carbon: 0.25% Max.
	SA 106 Gr C:	Thickness ≤ 20mm Carbon: 0.25 Max. Thickness > 20mm Carbon: 0.30 Max.
	SA335 GrP92:	Si: 0.10-0.50%; Ni: 0.30max and Cu: 0.25max

2.2 All raw materials used in steel making including incoming scrap shall be checked by supplier to ensure freedom from radioactivity (Applicable for SS material only).

3. DIMENSIONAL TOLERANCES:

3.1 SA335 Gr P91, P92: For outside diameter (OD) controlled Pipes the tolerance on OD shall be: ±1% (Max: 4mm) of Nominal OD.

3.2 Other than SA335 Gr P91, P92: For outside diameter (OD) controlled Pipes the tolerance on OD shall be: ±1% (Max: 6 mm) of nominal OD.

3.3 ID specified pipes are specified by the maximum internal diameter and minimum wall thickness. The tolerance if not specified 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,


Weight_{nom} = (ID_{nom} + t_{nom}) * t_{nom} * 0.02466 kg/metre, where

ID_{nom} = ID_{max} - 1.6mm; t_{nom} = t_{min} + 3.2mm

4. STRAIGHTNESS & POLYGONIZATION:

The Pipes shall not deviate from straightness by more than 1mm in any one meter and shall not be more than 6mm over the entire length *for Pipes of OD > 76.1mm*. A sharp bend at the end or kink and twist are not acceptable. These limitations are applicable for any given plane.

Also, for Pipes with OD ≤ 76.1mm, the pipes shall be made by process specified below:

	BHEL – Tiruchirappalli - 620014, India. Quality Assurance Department TECHNICAL DELIVERY CONDITIONS	Doc No: TDC:0:101 Rev No: 18 Effective Date: 11/11/2017 Page: 2 of 4
Product: Seamless Steel Pipes (for Boiler And Piping)		

1. All pipes shall be cold formed in case of " t/D " ratios > 0.15 , where " t " is the specified nominal wall thickness and " D " is the specified nominal OD of the pipe.
2. Pipes may be cold formed or hot formed in case of " t/D " ratios upto and including 0.15.
3. The degree of polygonization (P), measured as indicated in Fig.1 & calculated using the below formula, shall not exceed 15% in both the above cases:

$$P = \{[\sum S_B - \sum S_A] / [0.135 \cdot (3D - \sum S_A)]\} \cdot 100$$

Where, P is the degree of polygonization in %

D is the specified nominal OD of the pipe

$\sum S_B$ is the sum of maximum pipe wall thicknesses measured at 6 locations 60 degrees apart and

$\sum S_A$ is the sum of minimum pipe wall thicknesses measured at 6 locations 60 degrees apart.

Wall thickness shall be measured using profile projector/shadowgraph/digital scanner/any other suitable instrument meant for this purpose.

Definition of the measure points:

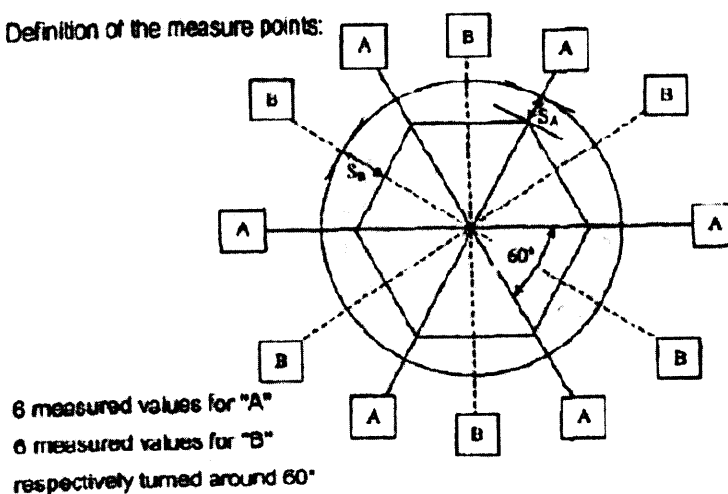


Fig. 1

5. HEAT TREATMENT:

The heat treatment temperatures and soaking time shall be reported in the test certificate.

5.1 CS: Hot Finished: OD $\leq 76.1\text{mm}$ no heat treatment required. OD $> 76.1\text{mm}$ shall be in Normalized condition.

CS: Cold Finished: All sizes – In sub critical annealed, fully annealed or in Normalised condition.

5.2 AS: All sizes – SA335 Gr P11, P12 & P22 – Either in Normalised and tempered or Isothermal Annealed condition.

5.3 AS: All sizes – SA335 Gr P91 & P92: All pipes Normalised as per *material* specification and Tempered at 750-780° C.

5.4 SS: All sizes – Solution Annealed condition as per *material* specification.

6. MECHANICAL TESTS:

a) As per specification. Quantum of test: As per specification – For each nominal size per heat per heat treatment batch. (Minimum 2 pipes for first 100 pipes and 1 per 100 or part thereof for pipes over 100 numbers, as per IBR).

b) For alloy steel pipes meant for fitting (As indicated in the Purchase order), test coupon shall be in normalised and tempered condition.

P91- TS: Min: 630MPa, Max: 850MPa; YS: (0.2% offset): 450MPa Min; Hardness (HB): Min: 195 Max: 250

P92- TS: Min: 630MPa, Max: 850MPa; Hardness (HB): Min: 190 Max: 250

P91, P92 hardness shall be checked on each pipe and values reported in MTC.



7. NON DESTRUCTIVE TEST:

7.1 ULTRASONIC TEST : ASTM E213

Calibration: Axial 50 mm long V or Square notch, one in OD and the other in ID. Notch Depth: 5% of Max.Thickness.(Min. 0.3 mm, Max. 1.5mm).

For ID<16mm one notch in OD is enough. Scanning:Clockwise and Anti clockwise.

7.2 SS: Finished pipes shall be checked for radioactive contamination and reported. Survey meter shall be used to measure at 5cm near the surface.

Acceptance limits: Shall be less than 0.1 milli Rontgen (mR) per hour or 1 micro Sievert per hour.

7.3 Photomicrograph test for P91 & P92 pipes - Photomicrograph test shall be carried out from a specimen of pipe in the as finished condition for individual size (OD and wall thickness) per heat per heat treatment batch . 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 and delta ferrite (to be maintained within 3% for Gr92 and within 2% for Gr91 when measured as per VD TUV 1272). Photomicrograph with 400x (Min) magnification along with Photomicrograph report to be provided. The actual magnification and structure shall be indicated in the report.

8. FINISH AND REPAIR:

The Inside & outside surfaces of the pipes shall be free from any imperfections & defects like laps,seams,folds, cracks, pitting etc;. Localised imperfections, if any, may be removed by *grinding or skin machining only*, ensuring the wall thickness, inside and outside diameter *to provide workmanship like finish*. Local depressions or ground spots are not acceptable. Loose scales shall be removed by blast cleaning in both inside and outside surface. Repair by welding is prohibited.

9. MARKING: (In English only): *All mandatory marking shall be done as per material specification (latest).*

9.1 Details to be identified: On Each Pipe (1) PO Number (2) Maker's emblem/code (3) Specification & grade (4) *Code case, if applicable* (5) Heat number (6) Size (*OD x Thickness x Length, in mm*), (7) No.of pipes (8) Inspector's seal

- Upto OD 31.8 (Excl.) – Sl.No: 1 to 8 to be stamped on metal or plastic tag attached to bundle.
- OD 31.8 to OD 76.1 (Incl.) – Sl.No:1 to 6, 8 to be paint stenciled on each pipe, 1 to 8 to be stamped on metal or plastic tag attached to bundle.
- OD > 76.1- Sl.No: 2 to 6 & 8 to be hard stamped with round edged stamp at 100mm from an end of each pipe and 1 to 6 to be paint stenciled on each pipe.

9.2 Colour Coding: *Continuous* longitudinal colour coding shall be done on the entire length of all pipes, *without masking stencilling*. *Colour coding scheme shall be* as per Procedure SIP: PP: 21 (latest).

10. PRESERVATION:

All pipes except SS shall be applied with resin type rust preventive coating with visibility to stencilled details on outside and either with rust preventive coating or rust inhibitor inside. Thick black coating which camouflages the surface of the pipes is not permitted. SS pipes to be surface treated as per ASTM A380 both inside and outside. Ends to be closed with end caps for secured storage.

11. PACKING:


- 1) Thickness ≤ 2.5 mm in boxes.
- 2) OD ≤ 159 mm in bundles.Others in loose condition.
Pipe bundles to be < 4 tons of equal no.of pipes,fastened with galvanised strap/ anti-rust coated (1x25mm.min.) for Carbon Steel & Alloy Steel and by Nylon strap for Stainless Steel at 2 ends & at 1m interval. Wooden pallets to cover pipes are not permitted.

12. INSPECTION AND CERTIFICATION (In English Only):

12.1 Products shall be inspected at works and the applicable IBR Form must be countersigned by the Inspecting Authority as indicated below:

Imported Items: Inspecting Authority approved by IBR for the Country of origin (To be concurred by BHEL before placing PO).

Indigenously Supplied items: *Director of Boilers/Chief Inspector of Boilers/Inspecting Authority approved by IBR, for the respective state.*

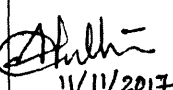
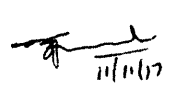

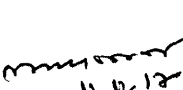
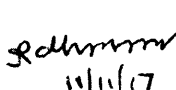
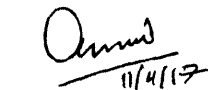
	BHEL – Tiruchirappalli - 620014, India. Quality Assurance Department TECHNICAL DELIVERY CONDITIONS	Doc No: TDC:0:101 Rev No: 18 Effective Date: 11/11/2017 Page: 4 of 4
Product: Seamless Steel Pipes (for Boiler And Piping)		

12.2 Certification in IBR Form III-A for *finished pipes* from “IBR-Well Known Pipe Maker” or “Inspecting Authority”, as applicable, *shall* be submitted to **BHEL**. Also, certification in **IBR Form IV** for the raw material signed by “IBR-Well Known Steel Maker” or “Inspecting Authority”, as applicable, *shall* be submitted to **BHEL**. Refer to **BHEL Engineering Drawing: 4-03-000-00062 (Latest Rev)** for **MAWP values for various material grades & sizes at various temperatures**.

12.3 **Additionally**, Manufacturer’s Test certificate (MTC) (ORIGINAL in ENGLISH) with following details *shall be submitted*:

- Purchase Order No. (BHEL), TDC No. *and its Rev No*, Test certificate No. & *TC Date*, Size and Quantity-Melt wise.
- Specification and Grade with year of code, Code case number (*if applicable*), Heat Number, Steel & Pipe making process, chemistry including incidental elements-Ladle and product Analysis.
- Heat Treatment details with actual temperature and soaking time
- Mechanical test Results.
- For P91, P92 supplies – the Photomicrograph test report along with photomicrograph with 400X (min) magnification shall be furnished.
- Detailed N.D.E. report with reference norms, Acceptance standards and test results.

12.4 **For SS**: Measured Radioactivity levels shall be reported in the Mill Test Certificate *and shall be submitted to BHEL* (Not to be recorded in IBR Form).

 11/11/2017	 11/11/17	 11/11/17	 11. 0. 17	 11/11/17	 11/11/17
Abdur Rahman	G. Panneer Selvam	M. Nadanakumar	N. Kirubakaran	R. Dharmar	Amit Roy
Sr. Engr/QA	DGM/QA	AGM/MM	SDGM/PE/FB	AGM/QC	AGM/QA&BE
Prepared By	Reviewed by				Approved By

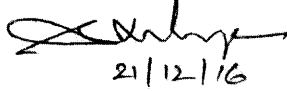
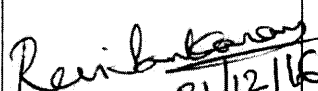
**BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPALLI 620 014**

QUALITY ASSURANCE

SIP: PP: 21 Rev. 07

Page 1 of 4

**COLOUR CODES FOR TUBES AND PIPES
(FOR BOILERS, PRESSURE VESSELS & HEAT EXCHANGERS)**

REVISION	DATE	PREPARED	REVIEWED	APPROVED
01	05-02-1999	R. Sasikumar	A. R. Reddy	K. Rengachari
02	22-07-2004	K. Ganesan	U. Revisankaran	C. R. Raju
03	20-01-2009	V. Kalyanaraman	S. Selvarajan	U. Revisankaran
04	13-05-2011	C. Haritha	V. Kalyanaraman	S. Selvarajan
05	27-05-2015	Vaibhav Saxena	S. Selvarajan	U. Revisankaran
06	28-10-2015	Vaibhav Saxena	Manu Shankar. H	S. Selvarajan
07	21-12-2016	 21-12-2016 Vaibhav Saxena	 21/12/16 S. Selvarajan	 21/12/16 U. Revisankaran

RECORD OF REVISIONS


Rev. No	Clause No.	Details of Revision	Remarks
01		New Specifications included based on TDC revision.	--
02		Amendment A1 dt. 26.04.01 issued for Rev. 01 incorporated. Colour code for SA 213 Gr. T23 added.	--
03		1) Colour code for SA 213 Gr. T92, P23, P92, SA178 Gr. D added. 2) Colour code for SA 210 Gr. C modified to BLUE only.(From BLUE & GREEN)	--
04		Colour code for super 304H added	--
05		1) First para modified for clarity for colour codes containing more than one colours. 2) UNS number for Super 304H added.	--
06		Colour code for super 304H corrected in line with Revision 04.	--
07		1) First paragraph modified to include Instructions for sequence for colour code bands. 2) Sl. No. column added in table. 3) Colour code for SA 312 Gr. TP 304H added.	--

Following Colour codes are to be applied as longitudinal bands (if not specified in other documents) on tubes & pipes to identify them to specification during receipt, storage, issue and processing. For heat exchanger tubes circumferential colour code can be provided at both ends of tubes (300 mm away from end). If the Colour code contains more than one Colour then bands of Colours shall be applied adjacent to each other without any overlap. ***In case of multiple colour bands, the sequence shall be maintained as indicated in the table.***

Sl. No.	Specification	Colour 1	Colour 2	Colour 3
1.	12 X 1 MØ	RED	YELLOW	
2.	13 Cr Mo 44	ALUMINIUM	BLACK	
3.	A 200 Gr. T5	ALUMINIUM	RED	YELLOW
4.	A 200 Gr. T9	ALUMINIUM	GREEN	YELLOW
5.	AISI 602	WHITE	YELLOW	
6.	API 5L Gr. B	ALUMINIUM		
7.	BS 3059 PART2 CDS/HFS 360	ALUMINIUM	BLACK	BROWN
8.	BS 3059 P2 S2 440	ALUMINIUM	BLACK	RED
9.	BS 3059 P2 S2 622 Gr. 490	ALUMINIUM	BLACK	GREEN
10.	BS 3602 PART1 CDS 360	ALUMINIUM	BLACK	BLUE
11.	NFA49-213 42C	ALUMINIUM	BLUE	BROWN
12.	NFA49-213 TU 10CD9.10	ALUMINIUM	BLUE	RED
13.	NFA49-213 TU 15CD2.05	ALUMINIUM	BLUE	GREEN
14.	NFA49-213 TU Z10CD9	ALUMINIUM	BLUE	YELLOW
15.	NFA49-213 TU Z10CDVNB09.01	ALUMINIUM	GREEN	RED
16.	SA 106 Gr. B	RED		
17.	SA 106 Gr. C	BLUE		
18.	SA 178 Gr. D	ORANGE		
19.	SA 179	BLACK	BLUE	GREEN
20.	SA 192	WHITE		
21.	SA 199 T5	BLUE	BROWN	RED
22.	SA 209 Gr. T1	ALUMINIUM	RED	
23.	SA 210 Gr. A1	YELLOW		
24.	SA 210 Gr. C	BLUE		
25.	SA 213 Gr. T11	ALUMINIUM	YELLOW	
26.	SA 213 Gr. T12	BROWN	YELLOW	
27.	SA 213 Gr. T2	BROWN	GREEN	
28.	SA 213 Gr. T22	GREEN	RED	
29.	SA 213 Gr. T23	RED	WHITE	
30.	SA 213 Gr. T5	BLACK	BROWN	GREEN
31.	SA 213 Gr. T9	BROWN	WHITE	
32.	SA 213 Gr. T91	GREEN	YELLOW	
33.	SA 213 Gr. T92	BROWN	BLUE	
34.	SA 213 Gr. TP 304	BLUE	GREEN	YELLOW
35.	SA 213 Gr. TP 304H	BLACK	BLUE	YELLOW
36.	SA 213 Gr. TP 304L	BLUE	WHITE	YELLOW
37.	SA 213 Gr. TP 309H	BLACK	BROWN	YELLOW
38.	SA 213 Gr. TP 316	BROWN		
39.	SA 213 Gr. TP 316 Ti	BLACK	BLUE	
40.	SA 213 Gr. TP 316L	BLUE	BROWN	YELLOW
41.	SA 213 Gr. TP 321	BLUE	WHITE	
42.	SA 213 Gr. TP 321H	BLACK	WHITE	
43.	SA 213 Gr. TP 347H	BLACK	YELLOW	

Sl. No.	Specification	Colour 1	Colour 2	Colour 3
44.	SA 268 Gr. TP 405	ALUMINIUM	GREEN	
45.	SA 268 Gr. TP 410	BROWN	RED	YELLOW
46.	SA 268 Gr. TP 443	BLUE	GREEN	WHITE
47.	SA 269 TP 316	GREEN	RED	YELLOW
48.	SA 312 Gr. TP 304	BLUE	YELLOW	
49.	SA 312 Gr. TP 304L	BLUE	RED	YELLOW
50.	SA 312 Gr. TP 304H	BLACK	BLUE	YELLOW
51.	SA 312 Gr. TP 316	BLACK	GREEN	
52.	SA 312 Gr. TP 316L	BLACK	BLUE	BROWN
53.	SA 312 Gr. TP 321	BLUE	BROWN	
54.	SA 312 Gr. TP 347	BLUE	RED	WHITE
55.	SA 333 Gr. 1	BLACK	BROWN	RED
56.	SA 333 Gr. 3	BLACK	GREEN	RED
57.	SA 333 Gr. 6	BLUE	GREEN	RED
58.	SA 334 Gr. 1	BROWN	GREEN	RED
59.	SA 334 Gr. 3	BLACK	RED	YELLOW
60.	SA 334 Gr. 6	BLACK	BLUE	RED
61.	SA 335 Gr. P1	BROWN	GREEN	YELLOW
62.	SA 335 Gr. P11	GREEN	WHITE	
63.	SA 335 Gr. P12	BLACK	RED	
64.	SA 335 Gr. P2	BLUE	BROWN	GREEN
65.	SA 335 Gr. P22	BLUE	RED	
66.	SA 335 Gr. P23	RED	WHITE	
67.	SA 335 Gr. P5	BLACK	BROWN	
68.	SA 335 Gr. P9	ALUMINIUM	BROWN	
69.	SA 335 Gr. P91	BROWN	RED	
70.	SA 335 Gr. P92	BROWN	BLUE	
71.	SB 163 Inconel	BLACK	GREEN	YELLOW
72.	ST 35.4	ALUMINIUM	BLUE	
73.	Steel 20	GREEN		
74.	Structural Tubes & Pipes	BLUE	BROWN	WHITE
75.	X20 Cr Mo V 121	BLACK		
76.	SA 213 UNS S30432(Super 304)	BLACK	RED	GREEN

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 BHEL - TRICHY	THIRD PARTY NON-DISCLOSURE AGREEMENT		Doc.No. : ISMS-04/TP/011	
			Ver. No: 3.0	Rev. No: 00
			Date : 27 - 10 - 14	

THIRD PARTY NON-DISCLOSURE AGREEMENT

I, _____, on behalf of the _____ (Name of Company), acknowledge that the information received or generated, directly or indirectly, while working with BHEL, Trichy on contract is confidential and that the nature of the business of the BHEL, Trichy is such that the following conditions are reasonable, and therefore:

I warrant and agree as follows:

I, or any other personnel employed or engaged by our company, agree not to disclose, directly or indirectly, any information related to the BHEL, Trichy Without restricting the generality of the foregoing, it is agreed that we will not disclose such information consisting but not necessarily limited to:

- Technical information: Methods, drawings, processes, formulae, compositions, systems, techniques, inventions, computer programs/data/configuration and research projects.
- Business information: Customer lists, project schedules, pricing data, estimates, financial or marketing data,

On conclusion of contract, I, or any other personnel employed or engaged by our company shall return to BHEL, Trichy all documents and property of BHEL, Trichy, including: drawings, blueprints, reports, manuals, computer programs/data/configuration, and all other materials and all copies thereof relating in any way to BHEL, Trichy 's business, or in any way obtained by me during the course of contract. I further agree that I, or any others employed or engaged by our company shall not retain copies, notes or abstracts of the foregoing.

This obligation of confidence shall continue after the conclusion of the contract also.

I acknowledge that the aforesaid restrictions are necessary and fundamental to the business of the BHEL, Trichy and are reasonable given the nature of the business carried on by the BHEL, Trichy I agree that this agreement shall be governed by and construed in accordance with the laws of country.

I enter into this agreement totally voluntarily, with full knowledge of its meaning, and without duress.

Dated at _____, this ____ day of _____, 20__.

Name

Company

Signature

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi – 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for

_____. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 – Commitments of the Principal

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-
 - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
 - 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved

in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he / she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant IPC/ PC Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3 – Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors". framed by the Principal.

Section 4 – Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/Bid Security.
- 4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/Performance Bank Guarantee, whichever is higher.

Section 5 – Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 – Equal treatment of all Bidders/ Contractors/ Sub-contractors

- 6.1 The Bidder(s)/ Contractor(s) undertake(s) to obtain from all subcontractors a commitment consistent with this Integrity Pact and report Compliance to the Principal. This commitment shall be taken only from those sub-contractors whose contract value is more than 20 % of Bidder's/ Contractor's contract value with the Principal. The Bidder(s)/ Contractor(s) shall continue to remain responsible for any default by his Sub-contractor(s).
- 6.2 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.
- 6.3 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 – Criminal Charges against violating Bidders/ Contractors /Sub-contractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 –Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

- 8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality.
- 8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
- 8.5 As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or heal the situation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
- 8.6 The Monitor will submit a written report to the CMD, BHEL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.
- 8.7 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.8 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant IPC / PC Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the

Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.9 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

8.10 The word 'Monitor' would include both singular and plural.

Section 9 – Pact Duration

9.1 This Pact begins and shall be binding on and from the submission of bid(s) by bidder(s). It expires for the Contractor 12 months after the last payment under the respective contract and for all other Bidders 6 months after the contract has been awarded.

9.2 If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified as above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 – Other Provisions

10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders/ contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

For & On behalf of the Principal

(Office Seal)

For & On behalf of the Bidder/ Contractor

(Office Seal)

Place-----

Date-----

Witness: _____

(Name & Address) _____

Witness: _____

(Name & Address) _____

BANK GUARANTEE FOR PERFORMANCE SECURITY

(Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s))

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY
IFSC AND MICR CODE

Dear Sirs,

1. In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at _____¹ through its Unit at.....(name of the Unit) having awarded to (Name of the Vendor / Contractor / Supplier) (VENDOR CODE) with its registered office at _____² hereinafter referred to as the ' Vendor / Contractor / Supplier ', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No.....dated³ valued at Rs.....⁴ (Rupees -----)/FC.....(in words.....) for⁵ (hereinafter called the 'Contract') and the Vendor / Contractor / Supplier having agreed to provide a Contract Performance Bank Guarantee, equivalent to% (.... Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

2. we,, (hereinafter referred to as the Bank), having registered/Head office at and inter alia a branch at being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer any sum or sums upto a maximum amount of Rs -----⁶ (Rupees -----) without any demur, immediately on first demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

3. 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. _____.

4. We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor / Contractor / Supplier in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

5. The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the Vendor / Contractor / Supplier shall have no claim against us for making such payment.
6. We thebank 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 Contract/satisfactory completion of the performance guarantee period as per the terms of the Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.
7. We.....BANK further agree with the Employer that the Employer 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 Contract or to extend time of performance by the said Vendor / Contractor / Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Vendor / Contractor / Supplier and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Vendor / Contractor / Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Vendor / Contractor / Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.
8. The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Vendor / Contractor / Supplier and notwithstanding any security or other guarantee that the Employer may have in relation to the Vendor / Contractor / Supplier's liabilities.
9. This Guarantee shall remain in force upto and including.....⁷ and shall be extended from time to time for such period as may be desired by Employer.
10. This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Vendor / Contractor / Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.
11. Unless a demand or claim under this guarantee is made on us in writing on or before the⁸we shall be discharged from all liabilities under this guarantee thereafter.
12. Any claim or dispute arising under the terms of this document shall only be enforced or settled in the Courts at Tiruchirappalli.
13. We..... BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.
- Notwithstanding anything to the contrary contained hereinabove:
- a) The liability of the Bank under this Guarantee shall not exceed.....⁶

- b) This Guarantee shall be valid up to⁷
- c) Unless the Bank is served a written claim or demand on or before (minimum 3 to 6 months from the expiry date ⁸ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

14. We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of
(Name of the Bank)

Dated.....

Place of Issue.....

BANK EMAIL ID:

BANK PHONE NO:

AUTHORISED SIGNATORIES CELL PHONE NO:

BANK FAX NO:

¹ NAME AND ADDRESS OF EMPLOYER I.e Bharat Heavy Electricals Limited

² NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

³ DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE

⁴ CONTRACT VALUE

⁵ PROJECT/SUPPLY DETAILS

⁶ BG AMOUNT IN FIGURES AND WORDS

⁷ VALIDITY DATE

⁸ DATE OF EXPIRY OF CLAIM PERIOD

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

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi – 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for

_____. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 – Commitments of the Principal

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-
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 - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.
 - 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved

in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he / she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant IPC/ PC Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3 – Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors". framed by the Principal.

Section 4 – Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/Bid Security.
- 4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/Performance Bank Guarantee, whichever is higher.

Section 5 – Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 – Equal treatment of all Bidders/ Contractors/ Sub-contractors

- 6.1 The Bidder(s)/ Contractor(s) undertake(s) to obtain from all subcontractors a commitment consistent with this Integrity Pact and report Compliance to the Principal. This commitment shall be taken only from those sub-contractors whose contract value is more than 20 % of Bidder's/ Contractor's contract value with the Principal. The Bidder(s)/ Contractor(s) shall continue to remain responsible for any default by his Sub-contractor(s).
- 6.2 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.
- 6.3 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 – Criminal Charges against violating Bidders/ Contractors /Sub-contractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 –Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

- 8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality.
- 8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
- 8.5 As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or heal the situation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.
- 8.6 The Monitor will submit a written report to the CMD, BHEL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.
- 8.7 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.8 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant IPC / PC Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the

Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.9 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

8.10 The word 'Monitor' would include both singular and plural.

Section 9 – Pact Duration

9.1 This Pact begins and shall be binding on and from the submission of bid(s) by bidder(s). It expires for the Contractor 12 months after the last payment under the respective contract and for all other Bidders 6 months after the contract has been awarded.

9.2 If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified as above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 – Other Provisions

10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders/ contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

For & On behalf of the Principal

For & On behalf of the Bidder/ Contractor

(Office Seal)

(Office Seal)

Place-----


Date-----

Witness: _____

Witness: _____

(Name & Address) _____

(Name & Address) _____

 BHEL - TRICHY	THIRD PARTY NON-DISCLOSURE AGREEMENT		Doc.No. : ISMS-04/TP/011	
			Ver. No: 3.0	Rev. No: 00
			Date : 27 - 10 - 14	

THIRD PARTY NON-DISCLOSURE AGREEMENT

I, _____, on behalf of the _____ (Name of Company), acknowledge that the information received or generated, directly or indirectly, while working with BHEL, Trichy on contract is confidential and that the nature of the business of the BHEL, Trichy is such that the following conditions are reasonable, and therefore:

I warrant and agree as follows:

I, or any other personnel employed or engaged by our company, agree not to disclose, directly or indirectly, any information related to the BHEL, Trichy Without restricting the generality of the foregoing, it is agreed that we will not disclose such information consisting but not necessarily limited to:

- Technical information: Methods, drawings, processes, formulae, compositions, systems, techniques, inventions, computer programs/data/configuration and research projects.
- Business information: Customer lists, project schedules, pricing data, estimates, financial or marketing data,

On conclusion of contract, I, or any other personnel employed or engaged by our company shall return to BHEL, Trichy all documents and property of BHEL, Trichy, including: drawings, blueprints, reports, manuals, computer programs/data/configuration, and all other materials and all copies thereof relating in any way to BHEL, Trichy 's business, or in any way obtained by me during the course of contract. I further agree that I, or any others employed or engaged by our company shall not retain copies, notes or abstracts of the foregoing.

This obligation of confidence shall continue after the conclusion of the contract also.

I acknowledge that the aforesaid restrictions are necessary and fundamental to the business of the BHEL, Trichy and are reasonable given the nature of the business carried on by the BHEL, Trichy I agree that this agreement shall be governed by and construed in accordance with the laws of country.

I enter into this agreement totally voluntarily, with full knowledge of its meaning, and without duress.

Dated at _____, this ____ day of _____, 20__.

Name

Company

Signature

**Technical: Seamless Tubes & Pipes Suppliers
(Carbon / Alloy / Stainless Steel)
Supplier Facility Report**

1. Name of the Company
2. Address of the Registered Office
(Telephone, E-Mail, Fax)
3. Factory Location and Address
(Telephone, E-Mail, Fax)
4. Installed Capacity (Tonnes / Year)
 - 4.1) Carbon Steel
 - a) SA 192
 - b) SA 210 Gr. A1, C
 - c) SA 106 Gr. B, C
 - d) Riffled Tube / SA 210 Gr. C
 - 4.2) Alloy Steel
 - a) SA 335 P11, P12, P22
 - b) SA 213 T11, T22
 - c) SA 335 P91, SA 213 T91
 - d) SA 335 P23, P92
 - e) SA 213 T23, T92
 - f) Riffled Tube /
SA 213 T12, T22, T23
 - 4.3) Stainless Steel
 - a) SA 213 TP 304H
 - b) SA 213 TP 347H
 - c) ²¹³SA TP 347HFG
 - d) Super 304H
5. Are you making your own steel
(Bloom) for making Tubes / Pipes ? YES ☐ NO ☐

6. If yes, for Sl. No. 5

- a) Type of Furnace
- b) Capacity of furnaces
(Metric Tonnes / Melt)
- c) Facility for manufacture
of Blooms

7. If No, for Sl. No. 5

- a) Source of Raw Material (Blooms)

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8. Tube / Pipe Manufacturing Facility details

8.1 Capacity of the rolling mill with respect to
Diameter (Minimum and Maximum),
Thickness (Minimum and Maximum) and
Length (Maximum)

- a) Through Hot Finishing
- b) Through Cold Finishing

8.2 Type & Make of Hot Mill along with the details
of the Individual Equipments

--

8.3 Type & Make of Cold Mill along with the details
of the Individual Equipments

--

9. Heat Treatment Facility Details

- a) Capacity of the Furnaces
- b) Type of Heat Treatment Carried out
(Batch or Continuous)

10. In House Testing Equipments Details

- a) Online UT Facilities
- b) Online Eddy Current (EC) Facility
- c) Hydro Test Facilities
(Indicate the Maximum Pressure)
- d) Chemical and Mechanical Testing Facilities

11. Details of Accreditation for Quality Systems
(Like ISO, ASME, API etc.,)

--

12. Are you Approved by any
Third Party / Statutory Agency ?
If so, specify the Agency (Attach details in ENGLISH)

13. Have you manufactured the following
Size / Specification / Length to
BHEL or any other well-known Boiler Manufacturer for Boiler Application
Please provide the details of to whom, when and how much supplied.

a) TUBES:

TUBES REQUIREMENT- LENGTH : 6500 mm to 13800 mm			
SL. NO.	OUTER DIAMETER	WALL THICKNESS	SPECIFICATION
1	21.3 to 73.01 mm	2.11 to 14.02 mm	SA 106 Gr B / Gr C (Carbon Steel) SA 335 P12, P22, P23, P91, P92 (Alloy Steel)
2	28.6 to 76.1 mm	3.2 to 12.5 mm	SA 192 / SA 210 Gr A1 / Gr C (Carbon Steel) SA 210 Gr. C (Rifle Tubes) SA 213 T12, T22, T23 (Alloy Rifle Tubes)
3	14 to 76.1 mm	3.2 to 12.5 mm	SA 213 T11, T22, T23, T91, T92 (Alloy Steel) SA 213 TP 304 H, TP 347 H, TP 347 HFG, Super 304 H (SS)

b) PIPES:

PIPES REQUIREMENT – LENGTH 3000 mm to 9000 mm			
SL. NO.	OUTER DIAMETER	WALL THICKNESS	SPECIFICATION
1	88.9 to 864.00 mm	3.96 to 148.0 mm	SA106 Gr B / Gr C (Carbon Steel)
2	88.9 to 965.00 mm	3.96 to 130.0 mm	SA335 P11, P12, P22, P23 (Alloy Steel)
3	127.0 to 812.8 mm	11.50 to 100.00 mm	SA335 P91, P92 (Alloy Steel)
4	88.9 to 323.9 mm	3.05 to 12.5 mm	SA312 TP304H, 321 H, 316 (SS)

14. Please go thro the attached Technical Delivery Condition (TDC) and give point-by-point confirmation.

a) For Tubes: TDC: 0:102, 0:105, 0:119

b) For Pipes: TDC: 0:101, TDG: 32, TDG: 100, TDG: 101, TDG: 26, TDG: 6876

PLACE :

DATE :

SIGNATURE WITH SEAL

NOTE: Enclose Additional Sheets / Annexures wherever required referring the Sl. No. of this format.

CEFI40051

BHEL recently received guidelines from Govt. Of India and Central Vigilance Commission and we have been asked to comply with the guidelines with regard to dealings with Indian Agent/Foreign Agent of Foreign Suppliers.

1. Mandatory submission of an Agency Agreement

- 1.1 It shall be incumbent on the Indian agent and the foreign principal to adhere to the relevant guidelines of Government of India, issued from time to time.
- 1.2 The Agency Agreement should specify the precise relationship between the foreign OEM/foreign principal and their Indian agent and their mutual interest in the business. All services to be rendered by agent/associate, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier/Indian agent. Any payment, which the agent or associate receives in India or abroad from the OEM, whether as commission or as a general retainer fee should be brought on record in the Agreement and be made explicit in order to ensure compliance to laws of the country.
- 1.3 In the absence of any agency agreement, BHEL shall not deal with any Indian agent (authorized representatives / associate / consultant, or by whatever name called) and shall deal directly with the foreign principal only for all correspondence and business purposes.
- 1.4 Agents will file an authenticated Photostat copy duly attested by a Notary Public / Original certificate of the Principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission / remuneration / salary / retainer ship being paid by the principal to the agent.
- 1.5 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the Foreign Principal.

2. Disclosure of particulars of agents / representatives in India

2.1 Tenderers of Foreign nationality shall furnish the following details:

- 2.1.1 The Bidder(s) / Contractor(s) of foreign origin shall disclose the name and address of the agents / representatives in India if any and the extent of authorization and authority given to commit the Principals. In case the agent / representative be a foreign Company, it shall be confirmed whether it is existing Company and details of the same shall be furnished.
- 2.1.2 The amount of commission / remuneration included in the quoted price(s) for such agents / representatives in India.
- 2.1.3 Confirmation of the Tenderer that the commission / remuneration, if any, payable to his agents / representatives in India, paid in Indian Rupees only.

2.2 Tenderers of Indian Nationality shall furnish the following details:

2.2.1 The Bidder(s) / Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any, indicating their nationality as well as their status, i.e. whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents / representatives.

2.2.2 The amount of commission / remuneration included in the price(s) quoted by the Tenderer for himself.

2.2.3 Confirmation of the foreign principals of the Tenderer that the commission / remuneration, if any, reserved for the Tenderer in the quoted price(s), paid in India in equivalent Indian Rupees on satisfactory completion of the Project or supplies of Stores and Spares in case of operation items.

2.3 Failure to furnish correct and detailed information as called for in paragraph 2.1 & 2.2 above will render the concerned tender liable to rejection or in the event of a contract materializing, the same liable to termination by BHEL. Besides this there would be a penalty of banning business dealings with BHEL or damage or payment of a named sum.

Please furnish the above information immediately