Records of Revn:00 :- Fresh Issue.
Records of Revn:01 :- Cl.No: 8.2 & 8.4 modified.

1.0 SCOPE

1.1 This Technical Delivery Conditions specify the requirements for Plate Formed Pipes (Electric-Fusion-Welded Steel with Filler metal added) made from **ASME SA515 / ASTM A515.**

1.2 The pipes are intended for water services (under Non-IBR Piping system only).

1.3 The pipes shall conform to the size and quantity as specified in the purchase order.

2.0 MATERIAL

The plates used for pipe shall meet all the mandatory requirements as per ASME SA515 Grade-60 / ASTM A515 Grade-60 fully killed.

Plates delivery condition : Rolled & Stress relieved.

3.0 DIMENSIONAL TOLERANCES

The tolerances limits are:

a) OD:- Upto NB 1600 mm: $\pm$ 4 mm; Above NB 1600 mm: $\pm$ 6mm
b) Thickness:- Upto 14mm : +1.3mm / -0.8mm; Above 14 mm : +1.4mm / - 0.8mm.
c) Ovality (Difference between major and minor inside diameter): 0.5% maximum
d) Squareness of ends: The ends of pipe section shall not vary by more than 3mm at any point from a true plane perpendicular to the axis of the pipe and passing through the center of the pipe at the end.
e) Length and quantity tolerance as per P.O.

4.0 MANUFACTURING

4.1 The pipe shall be of longitudinally welded as indicated in the P.O.
4.2 The ends shall be edge prepared as indicated in the purchase order.
4.3 Circumferential seams shall be minimum 1500 mm apart from each other and from ends.
4.4 The offset between any two subsequent Longitudinal joints **shall not be less than 90deg.**
4.5 All pipes shall be completely finished and free from surface, sub surface defects such as pits, cracks, weld spatters & laminations etc..

4.6 **Heat Treatment :** Heat treatment is **not mandatory** when the nominal thickness of a weld does not exceed 3 /4 in. (19 mm), and a minimum preheat of 200°F (95°C) is applied when the nominal material thickness of any of the base metals in the weld joint exceeds 1 in. (25 mm).

4.7 **Mechanical Test :** One Test Coupon for each 61m of weld length.
a) Transverse Tension test for weld seam
b) Guided bend test (Face & Root)

4.8 **Product analysis :** One Test Coupon for each 61m of weld length.

Vivekananda Yellur Dy.Mgr/QA	K. Rajitha SDGM/MM	C Vaithianathan AGM/QA	C. Karunakaran AGM/Engg	P. Ravi Shankar AGM/Quality
Prepared By	**Reviewed By**			**Approved By**

5.0 HYDRO TEST / NDE

5.1 For Pipe dia less than 1000mm:- 100 % Hydro test on each pipe + Radiography test for 100mm weld length at both the ends for 10% of the pipes.

5.2 For Pipe dia 1000 mm & above :-The NDT for each pipe shall be done by any one of the following options. The vendor shall indicate their choice in the offer.

a) 100 % Hydro test along with Radiography test for 100mm weld length on both the ends of each pipe.

b) 100 % Ultrasonic test + 10 % Radiography test on weld length +100% RT for all T- joints and 100% RT for 100mm weld length at both the ends for each pipe.

c) 100 % Radiography test on full weld length of each pipe (Longitudinal Seam + Circumferential Seam welds).

5.3 The Ultrasonic test / Radiography test shall be carried out as per ASME Sec-V and shall be accepted as per ASME B31.1 Cl:136.4.6 / Cl:136.4.5.

6.0 INSPECTION

6.1 All pipes shall be inspected by the vendor prior to BHEL / **Customers'** Inspection.

6.2 BHEL or BHEL authorized inspector / **Customer** will select the pipes at random and carryout the inspection. The necessary Material Despatch Clearance Certificate is to be obtained by the vendor prior to the despatch of material.

7.0 PAINTING AND PACKING

7.1 The pipes if despatched to BHEL Stores shall be coated with resin type translucent rust preventive on the outside unless otherwise specified in the P.O. Pipes of diameter above NB 350 mm, shall be coated inside also.

7.2 The pipes if despatched to project site directly shall be painted outside & coated inside as indicated in P.O.

7.3 In case of any special coating like Polyurethane, Rubber Lining, etc.. the vendor shall get BHEL approval for their QP and Procedure for application of internal coating.

7.4 Internal un-coated length (cut-back length) from both ends of the pipe shall be maintained as per drawing attached in P.O. to facilitate site joints.

7.5 Spiders & End Caps are to be provided on both ends of the pipes as per the drawing indicated in the enquiry / Purchase Order.

7.6 Sea worthy packing to be followed and shall be done as per the instructions given in Purchase order.

8.0 MARKING

8.1 The pipes despatched to **BHEL Stores** shall be **paint stencilled & hard punched** with the following details.

1) PO Number 2) Supplier's emblem/code 3) Size & Specification 4) Heat number
5) Pipe number 6) Inspector's seal

Vivekananda Yellu Dy.Mgr/QA	K. Rajitha SDGM/MM	C Vaithianathan AGM/QA	C. Karunakaran AGM/Engg	P. Ravi Shankar AGM/Quality
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8.2 The pipes despatched to Indian Sea Port as per Enquiry/P.O., the following details (furnished in the P.O. or separately) shall be **paint stencilled & hard punched** on both ends of the pipes in addition to the above.

- Work order No
- DU No
- Pipe Length (in mtr)
- Weight per Pipe length

8.3 For the pipe dia 1000mm and above marking-hard punch shall be done on internal surface in the uncoated area (i.e) within 100mm from pipe ends in addition to the paint stencilling on external surface. The hard punching shall be done at one end and paint stencilling at other end. In case of pipes of dia less than 1000mm the marking shall be done on outside surface.

8.4 ***Any other Marking & Identification which is not mentioned above Sl. No: 8.1, 8.2 & 8.3 shall be as per*** **Enquiry/P.O.**

9.0 CERTIFICATES

9.1 Three original test certificates typed in English shall be submitted along with the inspection report.

9.2 The test certificate shall furnish the following details.

a. BHEL P.O Number & Amendment Number(if any)
b. BHEL P.O. Serial Number
c. Test Certificate number.
d. Specification, grade, size, quantity
e. Heat number of plate (or pipe number with traceability to heat number)
f. Chemical composition and Mechanical properties
g. Hydrostatic test, UT, RT reports as applicable.
h. Dimensional report
i. Painting details

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Vivekananda Yellu Dy.Mgr/QA	K. Rajitha SDGM/MM	C Vaithianathan AGM/QA	C. Karunakaran AGM/Engg	P. Ravi Shankar AGM/Quality
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