Standard Operating Procedure	SOP No.
CARBON STEEL PIPE FABRICATION	5.044

DCR No.:11013
Revision No.: 2

Effective: 03-12-12
Supersedes: 06-09-08
Revision Date: 03-12-12
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1   Purpose

1.1   To establish a standard procedure for tacking and welding carbon steel piping.

2   Scope

2.1   This procedure applies to carbon steel piping.

3   Responsibility

3.1   It is the responsibility of the general foreman to verify that all tasks are performed by qualified welders per this procedure.

3.2   Qualified welders shall perform the following procedures.

4   Reference

4.1   American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel Code (BPVC), Section IX for Welding and Brazing Qualifications, current Edition/Addenda.

4.2   American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel Code (BPVC), Section II, Part A for Ferrous Material Specification, current Edition/Addenda.

4.3   American Society of Mechanical Engineers (ASME) B31.1 Pressure Piping Code for Power Piping, current Edition/Addenda.

4.4   American Society of Mechanical Engineers (ASME) B31.3 Pressure Piping Code for Process Piping, current Edition/Addenda.

4.5   American Society of Mechanical Engineers (ASME) B31.9 Pressure Piping Code for Building Services Piping, current Edition/Addenda.

5   Procedures

5.1   All material received must be checked against specification requirements.

5.1.1 Steam and chilled water systems usually consist of ASME Material Specification #SA-53 electric resistance welded (ERW) carbon steel material.

5.2 Welding process for carbon steel pipe

5.2.1 Outside diameter (3" or smaller): weld by gas metal arc welding (GMAW) process.

5.2.2 Outside diameter (3" or larger): weld with a combination process of GMAW for root and flux core arc welding (FCAW) for cap.

5.3 Before proceeding with tacking the joints, welder needs to clean the weld joint of any debris, dust, oil residues, etc.

5.4 Once the cleaning is done, the joint needs to be beveled and properly gapped for tacking.

5.5 A minimum of 3 tacks per joint is required to ensure an even gap around the full circumference of the joint. All tacks are to be cleaned by grinding and wire brushing to ensure that they are cleanly and fully consumed into the root pass.

5.6 Welding is to be carried out in 2 passes (minimum): GMAW or a combination of GMAW and FCAW.

5.7 Weld a portion of the root pass. Then clean the joint thoroughly for examination by grinding and wire brushing.

5.7.1 Visually examine the root pass weld and verify proper weld machine settings and joint penetration.

5.7.2 If unable to visually examine the interior of the completed root pass, then visual examination of partial root pass (20-30%) by Therma certified VT Examiner is required before proceeding.

5.8 Following interpass cleaning, the welder caps the joint. The final weld bead is cleaned by wire brushing only.

5.9 Verify the dimensions match the fabrication drawing. Edit with red pen and record initials and date. Return the drawing to foreman or detailer so as-built edits are captured.

5.10 Notify Therma Corp certified VT Examiner for final weld examination.

5.11 Fabrication is moved to the loading area.

5.12   Welds are primed for rusting prevention, and fabrication is ready for shipping.

6   Review and approval

6.1   No approval is necessary

Document Approval

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Engineering Manager

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