Course: ASME IX and ASME B31.3

Objectives and Description

This is a hybrid three-day course which will train the participants to achieve economical compliance with the requirements of ASME Section IX and examine the requirements of ASME B31.3 related to materials, fabrication and installation and inspection.

Participants will gain a working knowledge of ASME Section IX, *Welding and Brazing Qualifications* with emphasis on demonstrating code compliance. A review of the welding processes and common variables will be conducted in order to provide all participants with sufficient background in the technology involved to interpret and understand Section IX. The mechanics of using Section IX and how to address its requirements will be explained in a simple, straightforward manner. Emphasis will be placed on writing welding procedures so that they contribute positively to the manufacturing process and on qualifying those procedures in a cost-effective manner. The requirements for welders, brazers and operators will be examined with particular emphasis on minimizing the cost and maximizing the usefulness of qualifications.

The second part of the course will cover the materials, fabrication, installation, inspection and testing of piping following the requirements of ASME B31.3, *Process Piping*. Special emphasis will be place on code compliance for welded construction and inspection.

The seminar will be conducted in a lecture/discussion format with opportunity attendees to discuss specific concerns and issues. Time will be provided to address individual participant's problems and concerns. Attendees will receive copies of the course notes covering the course's content.

Who Should Attend

This course is intended for people who are involved in writing and qualifying welding and brazing procedure specifications, qualifying welders, brazers and operators, reviewing of suppliers procedures, auditing or reviewing in-house procedures and qualifications and estimating jobs which impose the requirements of Section IX and B31.3. Welding Engineers, quality assurance personnel, auditors, testing laboratory personnel, maintenance personnel and jurisdictional inspection personnel will find this course interesting, exciting and beneficial.

First Day

History and Structure

Historical Development of ASME Codes; Relationship of Section IX to Other Codes; Organization and Structure; Mechanics of Using Section IX - Essential, Nonessential and Supplemental Essential Variables.

Review of Welding Processes and Variables

Shielded Metal Arc Welding; Gas Tungsten Arc Welding; Gas Metal Arc Welding; Submerged Arc Welding. F-Numbers, A-Numbers, SFA Specifications, non-SFA Filler Metals.

Writing the Welding Procedure Specification

Meeting Code Requirements; Addressing Customer Requirements; Providing Direction to the Welder; Sources of Information for Preparing Intelligent and Meaningful Welding Procedure Specifications.

Selecting and Preparing the Test Coupon

Obtaining Maximum Cost-effectiveness from Test Coupons; Preparation and Welding of the Test Coupon; Recording both Necessary and Worthwhile Data; Demonstrating Code Compliance.

Second Day

Practical Session

Writing the Welding Procedure Specification; Use of Section IX Form; Other

Formats; Procedure Qualification Record Forms; Revisions to Records and Procedures.

Supplemental Variables - Special Considerations for Notch-Toughness

How Welding Influences Toughness; Measuring and Recording Heat Input Data; Translating Heat Input Data into Useful Directions for a Welder; Typical Construction Code Requirements (Section VIII as example).

Welder and Welding Operator Qualifications

Selection of Test Coupons to Minimize Testing Costs and Simplify Record Keeping; Conducting Performance Tests; Organizational Responsibility and Ownership of Test Records; Testing of Coupons and Recording of Test Data; Maintaining Continuity of Qualification.

Third Day

Scope of B31.3

Selection of the correct Code; Structure of B31.3; Fluid Service Categories; Responsible Parties

Design Overview

Basic considerations; General Design considerations; types of Supports and restraints

Materials

Permitted materials; Allowable stresses; Rated components; typical materials specification; Low temperature service and impact testing; Purchasing and Receiving of materials, positive material identification

Fabrication, Assembly and Erection

Welding Process selection, economics and quality; B31.3 welding requirements; Preparation for welding; Groove, fillet and branch connections; Repair welding; Preheating; Postweld Heat Treatment; Definition of thickness; Bending and forming; Brazing and soldering; Threaded and flanged connections; Installation of supports and restraints

Inspection, Examination and Testing

Review of inspection and examination Methods; ASME Section V overview; Extent of examination, acceptance criteria; Alternative examinations; Economics of examinations beyond Code; Pressure and leak Testing

ISO 15649, Petroleum and natural gas industries —Piping

Implementing B31.3 to achieve compliance

Course: ASME IX and ASME B31.3

Instructor

Walter J. Sperko, P.E., is President of Sperko Engineering Services, Inc. which he founded in 1981. Mr. Sperko has extensive experience in welding engineering, metallurgical engineering, design, failure analysis, and quality assurance. His industrial experience is primarily with piping, pressure vessels, storage tanks and structural steel. He hold a BS in Metallurgical Engineering from the University of Notre Dame and is a professional Engineer registered in North Carolina and other states.

Mr. Sperko worked for Ebasco Services in the Materials Engineering and QA group, for ITT Grinnell Industrial Piping as manager of Piping Fabrication Technology and Standards and for Richmond Engineering Company as Corporate Welding Engineer and branch plant Quality Control Manager.

He is Vice-Chairman of ASME Boiler and Pressure Vessel Code Subcommittee IX, *Welding and Brazing Qualifications* and a member of several of its subgroups; he is also a member of ASME Subcommittee III, *Nuclear Components*, Subgroup on Materials, Fabrication and Examination; Chairman, ASME Subcommittee B31.9*, Building Services Piping*; a member of the B31 Standards Committee; a member of AWS Technical Activities Committee; Chairman of AWS International Standards Activities Committee (US TAG to ISO TC-44), and a member of AWS D-10, Committee on Piping and Tubing.

Mr. Sperko teaches publicly-offered courses worldwide in piping design, analysis and fabrication and also in welding and brazing under the rules of ASME Section IX. He has published articles in the Welding Journal, Welding Design and Fabrication and The Fabricator; he co-authored the piping design section of the Standard Handbook of Plant Engineering. He holds four US patents.