

Standard Welding Procedures

By Walter J. Sperko

Standard welding procedures have been used in the structural steel industry for many years. Revisions published in the 2000 Addenda to the ASME Boiler and Pressure Vessel Code allow their use by ASME Certificate Holders.

A Task Group was formed in 1991 to review the newly-published American Welding Society (AWS) Standard Welding Procedure Specifications (SWPS) to determine their usability within the Code from a technical and administrative standpoint. The Group was led by Dale Hackney, Chairman of Subcommittee IX, with members from the various construction Section Subcommittees to provide a balanced perspective. They were requested to determine (1) if SWPS's were technically adequate for the construction requirements of the Code and (2) what administrative barriers exist in the code to the adoption of the SWPSs. Their conclusion was that SWPSs were technically adequate and that there were no major administrative barriers, but there were not a sufficient number of useful SWPSs available at that time (only 2) to make further effort worthwhile. By 1995, a sufficient number of SWPSs had

been published, and the task group was reactivated under the current Subcommittee IX Chairman, Joel Feldstein.

The task group met over approximately 4 years, primarily discussing how to implement SWPSs.

It was agreed that SWPSs should be permitted to be used by manufacturers' without qualification of the SWPS by the manufacturer. Although there are many procedure qualification records that AWS used in the development of SWPSs, they are not published or available to users.

It was agreed that the SWPS should be formally adopted by the manufacturer. Adoption includes entry of the manufacturer's name, designation of the Code Section(s) and other fabrication documents under which the SWPS will be used, and the signature and date of a responsible employee of the manufacturer. Each SWPS provides spaces in which this information can readily be entered.

It was agreed that, in lieu of performing one or more procedure qualification tests, each manufacturer will have to make and document a demonstration weld following a typical SWPS. The purpose of this demonstration weld is to require the manufacturer to demonstrate and document that he knows enough about welding to follow the SWPS. After welding and testing one demonstration coupon, many other SWPSs may typically be used without further demonstrations.

The reason for this demonstration weld is the loss of any demonstration of technical competence by the manufacturer as is shown during qualification of a welding procedure specification (WPS) under ordinary Code rules. This requirement to demonstrate is similar to the long historical provisions of the

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B31 Code for Pressure Piping that allow a WPSs qualified by one organization to be used by another organization provided the second organization qualifies one welder following that WPS.

Inclusion of this demonstration as part of the SWPS adoption process was critical to passage of SWPSs because of the disheartening experiences various committee members and others who have had to deal with small manufacturers whose knowledge of welding technology was miniscule.

A convenient form for documenting the demonstration weld is in nonmandatory Appendix B as Form QW-485. It should be noted that the form includes a demonstration number that is to be included on each SWPS that is adopted.

The specific requirements regarding the adoption, demonstration weld and production application of SWPSs are covered in Article V (i.e., QW-500, page 183.2) of Section IX. QW-510(d) provides a detailed listing of the welding conditions that must be documented during the demonstration weld. It should be noted that QW-500 does not address using a demonstration weld to simultaneously qualify a welder. The astute manufacturer can comply with the demonstration requirements and also qualify a welder simply by completing both forms QW-484 (for the welder) and QW-485 (for the demonstration weld) upon successful welding and testing of the demonstration coupon.

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QW-500 also addresses production limitations of SWPSs. These include strict compliance with the SPWS, such as using only the groove designs with the tolerances shown, the electrode sizes and amperages shown and the shielding gas flow rates shown. SWPSs may not be supplemented with additional PQRs or used in a joint together with WPSs qualified by the manufacturer. The manufacturer may provide more restrictive direction to the welder provided that direction does not violate the SWPS.

The Task Group agreed that technical review and approval of SWPSs for use with the ASME Boiler and Pressure Vessel Code is the responsibility of the Subcommittee IX, while the construction Subcommittees could determine if each SWPS is appropriate for its Section. At this time, no construction Subcommittee has taken exception to the listing of SWPSs shown in Appendix E of Section IX.

A Subcommittee IX task group reviewed 45 AWS SWPSs and determined that 23 met the procedure specification requirements of Section IX. Some of the SWPSs that were not accepted were written for sheet metal and not appropriate for ASME work at this time, and others needed minor corrections. AWS will continue to revise and publish SWPSs, and Subcommittee IX will continue

to evaluate them and approve their use as appropriate.

The permitted SWPSs are listed in Appendix E of Section IX. These SWPSs cover welding of P/S-1 and P/S-8 metals using SMAW, GTAW and GMAW-FC. Typical thickness ranges permitted are 1/8 to 1-1/2 inches and both as-welded and postweld heat treated procedures (for P/S-1 metals) are available.

Those who elect to use SWPSs will have to purchase them from AWS (1-800-443-9373). In addition to purchasing individual copies of SWPSs, AWS has site license purchase arrangements available.

This brief article cannot replace the careful review of these newly adopted revisions of the Code by a Manufacturer. After such a review, an organization may find it to their advantage to use the SWPSs.

Thickness of Welder Test Coupons

Another major change in the 2000 addenda of Section IX is that the thickness that a welder will have to deposit on his test coupon in order to be qualified for "unlimited thickness" has been reduced from 3/4 to 1/2 inch. This change appears in the revisions to the table and notes in QW-452.1.

When using this new provision, the welder must deposit at least 3 layers of weld metal with a single welding process and set of variables as well as at least 1/2 inch of weld metal.

When the test coupon is welded using more than one process or set of essential variables, QW-306 requires that the deposit thickness for each process and set of variables be considered separately when determining the thickness for which the welder is qualified. That is, if the test coupon is 1/2 inch thick and the weld is made using E6010 and E7018, there is a change in the F-number, and the thickness of weld metal made using each electrode type must be considered separately. In this case, the welder would not be qualified for unlimited thickness using SMAW.

For more information, please contact Joseph Brzuskiewicz, Project Engineering Administrator, ASME Pressure Technology Codes and Standards (Tel. 1-212-591-8533, Fax 1-212-591-8501, Email brzuskiewiczj@asme.org).

¹ The term "manufacturer" refers to any organization that has responsible operational control for producing weldments in accordance with any Section of the Code

BPVC Data Report Forms on the Internet

ASME Data Report Forms, as referenced in the Boiler and Pressure Vessel Code for recording of code-related information, are now available as downloadable pdf files. An index of available forms is available on ASME's internet site: www.asme.org/codes

Simplification of Nuclear Scopes

In November of 1998 there was a change in the nuclear accreditation process. Using wording based on Table NCA-1800-1 the scope statements seen on Nuclear Certificates of Authorization/Accreditation, including Quality System Certificates, were simplified. The intent of this change was to provide concise standardized scope statements.

ASME has been open to feedback, as the system has been implemented. Often the response has been gauged by the impressions of ASME Team Leaders, who are seeing the effective changes, and hearing the opinions expressed directly from company's quality assurance managers. Most of the feedback has offered praise for the new scope statements.

In reaction to concerns presented, the Subcommittee on Nuclear Accreditation reevaluated the simplifications and took steps to find a resolution. One comment

focused on the lack of specificity in regards to the manufacturing of welding material. The manufacturing of welding material, is a unique operation, and should be distinct in a company's scope. Therefore, a refinement was announced on March 3, 2000, which now includes the option to reference "manufacturing welding material" in the body of the scope. This change is now available to new and renewing companies. Companies, whose scopes do not presently include this option, may apply for a revised certificate without charge, with the provision that their survey adequately addressed the manufacturing of welding material.

If you have any comments regarding the simplification of scopes or would like more information concerning the Nuclear Accreditation Program please contact Felicia Zusman at 1-212-591-8586.

Development of New Section VIII, Division 2

A SME is working with the Pressure Vessel Research Council (PVRC) to develop a new world-class Section VIII, Division 2 pressure vessel design code, taking into consideration the latest developments in materials, design, fabrication, and inspection technologies. A major goal in the development of this new code is to optimize the design code rules to balance technology, user-friendliness, and regulatory acceptance. The new design code will be based on the existing ASME Section VIII Division 2, Division 3, and Division 1; existing ASME Pressure Vessel Code Cases; other international codes; and information contained in technical papers including ASME publications and Welding Research Council (WRC) bulletins. It is anticipated that the new design code will be organized similar to Section VIII, Division 3.

A Task Group on Continued Modernization of Codes (TGCMC) has been formed, and one of their activities is obtaining user-feedback with regard to aspects of the present Section VIII, Division 2 Code that should be revised or updated. Among the items being studied are:

- Simplified requirements for a User Design Specification (UDS)
- Simplified requirements for Manufacturer's Design Report (MDR)
- New design procedures for nozzles, conical transitions, etc.,
- Requirements for Registered Professional Engineer's Stamp on UDS and MDR
- Alternative non-destructive examination requirements (spot RT, etc.)
- Alternative PWHT requirements
- Alternative material toughness requirements

ASME welcomes your input on these matters. Comments can be submitted directly to the Task Group at Pvrcoho@aol.com.

Code Cases on the Internet

ASME International is offering a new service to users of the BPVC that allows you to download and print official copies of Code Cases which have been approved, but not yet been released in a printed Supplement. Because these cases clarify the intent of existing requirements or provide, when the need is urgent, rules for materials or constructions not covered by existing Code rules, the ability to have access to these within a few days of final approval rather than having to wait for them to be batched into a specific supplement provides an enhanced level of service. This site (<http://206.20.98.55/>) also allows visitors to query ASME's database tracking the Boiler and Pressure Vessel and Nuclear Code Cases regarding other cases which have already been released in a printed Supplement, but are not available for download. To encourage usage, there will be no fee associated with this new service during its introduction.

ASME Certificate Holders



Managing Director, Conformity Assessment – David Wizda, 1-212-591-8590, wizdad@asme.org
Board on Conformity Assessment – Alan Bagner, 1-212-591-8580, bagnera@asme.org

ACCREDITATION PROGRAMS

- AIA Qualification of Authorized Inspection Agencies, nuclear and non-nuclear, based on the ASME QAI-1 Standard (formerly N626.1)
Bibi Rahim, 1-212-591-8465, rahimb@asme.org & Ken Baron, 1-212-591-7019, baronk@asme.org
- FAP Fastener manufacturers, distributors, and laboratories
Bibi Rahim, 1-212-591-8465, rahimb@asme.org & Felicia Zusman, 1-212-591-8586, zusmanf@asme.org
- BPV Boiler and Pressure Vessels
Joseph Pang, 1-212-591-8525, pangj@asme.org; Sandra Bridgers, 1-212-591-8465, bridgers@asme.org; Ken Baron, 1-212-591-7019, baronk@asme.org
- N-type Nuclear component manufacturers and assemblers (vessels, tanks, pressure piping, and pressure relief devices)
Bibi Rahim, 1-212-591-8465, rahimb@asme.org & Felicia Zusman, 1-212-591-8586, zusmanf@asme.org
- PRD Pressure relief device testing laboratories and authorized observers
Joseph Pang, 1-212-591-8525, pangj@asme.org; Sandra Bridgers, 1-212-591-8465, bridgers@asme.org; Ken Baron, 1-212-591-7019, baronk@asme.org

- QEI Elevator Inspector certifying organizations
Bibi Rahim, 1-212-591-8465, rahimb@asme.org & Joseph Pang, 1-212-591-8525, pangj@asme.org
- QSC Nuclear material organization (material manufacturers and suppliers)
Bibi Rahim, 1-212-591-8465, rahimb@asme.org & Felicia Zusman, 1-212-591-8586, zusmanf@asme.org
- RTP Manufacturers of reinforced thermoset plastic corrosion resistant vessels
Bibi Rahim, 1-212-591-8465, rahimb@asme.org & Felicia Zusman, 1-212-591-8586, zusmanf@asme.org

REGISTRATION PROGRAM

- ISO Registration of suppliers of mechanical equipment and related materials, items, and services in the industries and sectors associated with the art, science, and practice of mechanical engineering
Christine Bujal, 1-212-591-8592, bujalc@asme.org & Ken Baron, 1-212-591-7019, baronk@asme.org

To receive an ISO 9000 proposal or cost information on an ASME Accreditation review, contact:
Raj Manchanda
Phone: 1-212-591-8033
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Email: accreditation@asme.org

CERTIFICATION OF PERSONNEL

- QHO Operators of hazardous waste incinerators
Sandra Bridgers, 1-212-591-8465, bridgerss@asme.org & Felicia Zusman, 1-212-591-8586, zusmanf@asme.org
- QMO Operators of medical waste incinerators (MWIs)
Sandra Bridgers, 1-212-591-8465, bridgerss@asme.org & John Millman, 1-212-591-8584, millmanj@asme.org
- QRO Operators of resource recovery facilities processing municipal solid waste (MWCs)
Sandra Bridgers, 1-212-591-8465, bridgerss@asme.org & John Millman, 1-212-591-8584, millmanj@asme.org
- QFO Operators of high capacity fossil fuel fired plants
Sandra Bridgers, 1-212-591-8465, bridgerss@asme.org & John Millman, 1-212-591-8584, millmanj@asme.org
- Y14 Geometric dimensioning and tolerancing professionals (GDTP)
Sandra Bridgers, 1-212-591-8465, bridgerss@asme.org & John Millman, 1-212-591-8584, millmanj@asme.org



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