Summary of Changes in

ASME Section IX, 1998 Edition

Prepared by

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The following is a summary of the changes that will appear in the 1998 Edition of ASME Section IX. These changes and related discussion are reported by Walter J. Sperko, P.E., Vice-chairman of Subcommittee IX; readers are advised that the opinions expressed in this article are those of Mr. Sperko and not the official opinion of Subcommittee IX.

Mandatory Date

As discussed in the update for the 1997 addenda which was published in the January issue of the *Welding Journal*, new editions of the ASME Code never contained revisions; this edition does contain revisions, and they will become mandatory January 1, 1999. More importantly, the next addenda, rather than being issued December 31, 1998, will be issued June 30, 1999 and each June 30 thereafter.

Identifying Revisions

As has the practice anytime there was a change to the Code, revisions are marked in the margin of the text at each revised paragraph. In this edition, revision locations are marked with "98" on each paragraph which has been changed technically. Editorial changes, such as spelling corrections, corrections to references and other non-technical changes, are usually not marked at each paragraph, but they are listed in the "Summary of Changes" that is at the front of the Code book.

Metrication

Code users will notice that the 1998 Edition contains SI (metric) equivalent units in parenthesis following the standard units. For the 1998 Edition, the text will show both units; figures and tables will be changed in later editions. This change is being made for the convenience of the user; the conventional units will continue to be the official units. The addition of metric units to the text is considered editorial, so the locations of these changes are not marked with "98". One unusual conversion is from Nominal Pipe Size (NPS) to Diameter Number (DN). These conversions are shown in Table 1 and are officially published in ASME B36.10, *Welded and Seamless Wrought Steel Pipe.*

Another Canadian Materials Standard Assigned P-Number

Most of the revisions in the 1998 Edition were in Table QW/QB-422 (the P/S-number table), and they were mostly editorial in nature.

The process of assigning P-numbers to materials manufactured to standards which are not published by organizations based in the US continues. CSA-G040.21, Grade 44W, which covers carbon steel plates, bars and shapes, was added as a P-1, Group 1 material. Additional non-US standards are in the works, including BS EN 10028-2 which covers carbon steel plate.

Other materials that have been added are SA-351, Grade CN3MN, SB-366, UNS N08020, SB729, UNS N08020, SA-743, Grade CN3MN and SA-749, Grade CN3MN. These are all P-45 metals.

Base Metals Used for Welder Qualification

Prior to the 1998 edition, the material that was used for a welder test coupon had to be either a P-number or S-number material, or it had to be the unclassified material if the welder was going to weld on an unclassified material. Beginning in the 1998 Edition, metals used for welder qualification may conform to *any* national or international stan-

dard or specification, and, provided it meets the mechanical and chemical requirements of an assigned metal, that metal may be considered as having the same P or S-number as the assigned metal. When using an unassigned metal, the specification of the material used and the corresponding P or S-number must be recorded on the qualification record. It would also be a good idea to document the corresponding P or S-number material that the unassigned material matches, but this is not required by Code.

Aluminum Welding

For those who weld aluminum, a small oversight has been corrected. QW-433 previously permitted welders who qualified using F-21 through F-24 electrodes and filler metals to use any electrode or filler metal which was F-21 through F-24. F-25 fillers were not included in this set of materials, apparently due to simple oversight. The revision increases the range of electrodes and fillers that may be qualified and used to include F-25.

Maintenance and Renewal of Welder/Operator Qualifications

The 1997 Addenda of Section IX contains an editorial error in QW-322.2(a) which is corrected in the 1998 edition. The 1997 addenda paragraph says:

"Renewal of qualification expired under QW-322.1(a) or (b) above may be made. . "

The 1998 edition will editorially delete the "or (b)" phrase, so that the sentence will read:

"Renewal of qualification expired under QW-322.1(a) above may be made. . . . "

Since this is an editorial correction to the 1997 addenda, it is important for Code users to recognize that the "or (b)" paragraph should not have been printed in the first place and, therefore, was never part of the Code. Technically, this is important because the reference to "or (b)" permitted a welder to qualify on any type test coupon, even though his qualifications had been revoked because there was specific reason to questions his ability to weld under some condition. It has always been the intent of the Code that, when a welder's qualifications are revoked because of his demonstrated inability to make a weld under some specific condition (e.g. overhead), his requalification test coupon had to be welded using the condition that was questioned (i.e., overhead). This has not changed.

Stainless Steel Welding

The A-number table, QW-442, has been revised to expand A-9 to include additional "super-austenitic" electrodes such as ER383 and ER385. A-9's chromium range has been expanded downward from 20% to 19% and molybdenum's upper limit has been raised from 4% to 6%.

Resistance welding

Many years ago, rules were added to address spot, seam and projection resistance welding. Included in those rules was a requirement to demonstrate that the equipment (power supply, clamping equipment, cooling equipment, cables, etc.) is capable of making 100 consecutive welds of satisfactory quality. These rules adequately addressed spot and projection welds, but the did not address qualification of equipment that was

used for seam welding since seam welds are not individual welds which can be counted easily. The new rules simply require that the same test coupon as is required for procedure qualification be made for each welding station to demonstrate the ability of the that equipment to make satisfactory welds on a production basis.

Inquiries

In brazing, there was an inquiry asking if a section test was a substitute for a peel test, or if the peel test had to be performed also. The section test shown in Figure QB-462.4 is a substitute for the peel test when the braze metal is stronger than the base metal. This is permitted by note 1 of QB-451.3. The braze metal is stronger than the base metal in many brazing situations, such as when brazing copper to copper using a BCuP or a BAg type filler metal or nickel to nickel using a BNi-5 filler.

A perennial question was asked, but this time with a new twist. The question was whether or not a manufacturer was permitted to use a WPS that was qualified by another organization. The twist was that the manufacturer who was going to build the Code item would use WPSs provided by the purchaser of the component. The answer was, predictably, no.

A question that arose from the European community was whether or not a preliminary WPS had to be attached to the WPS. Section IX, QW-201, requires that WPSs be qualified by welding and testing of test coupons; this could be interpreted to require that a "preliminary" WPS has to be followed when the test coupon is welded. Such a "pWPS" is a working concept in the pending revisions of EN 288, *Specification and approval of welding procedures for metallic materials*, but it is not and ASME concept, and the answer was "no."

Coming Events

As is apparent, Subcommittee IX did not make many changes to the Code since the last addenda; however, the Subcommittee has not been idle. Some highlights of issues that are on the agenda include revisions to the definitions, reworking of the brazing section, use of ultrasonic examination for welder qualification (not likely to go far. . . .) and – hold on to your hats – adoption of the Standard Welding Procedure Specifications (SWPSs). SWPSs which are being considered are those that have been published by AWS as part of the B2.1 Committee's series of standard WPSs (e.g., ANSI / AWS B2.1-.001-90, *Standard Welding Procedure Specification for Shielded Metal Arc Welding of Carbon Steel (M-1/P-1/S-1, group 1 or 2, 3/16 through 3/4 inch, in the As-welded Condition with Backing)*). AWS has issued many SWPSs, including those for welding carbon and stainless steel using GTAW, SMAW and GMAW-FC. It appears that these SWPS (which are already permitted for repairs and alterations under the National Board Inspection Code) will be permitted with some restrictions without qualification of the WPS by the manufacturer or contractor. It may take a year or two for this to happen, but it appears likely that it will.

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Table 1

Conventional Units		SI (Metric) Units	
Nominal Pipe Size (NPS)	Outside Diameter (in.)	Diameter Number (DN)	Outside Diameter (mm)
1/8	0.405	3	10.3
1/4	0.540	6	13.7
3/8	0.675	10	17.1
1/2	0.840	15	21.3
3/4	1.050	20	26.7
1	1.315	25	33.4
1-1/4	1.660	30	42.2
1-1/2	1.900	40	48.3
2	2.375	50	60.3
2-1/2	2.875	65	73.0
3	3.500	80	88.9
3-1/2	4.000	90	101.6
4	4.500	100	114.3
5	5.563	125	141.3
6	6.625	150	168.3
8	8.625	200	219.1
10	10.75	250	273.0
12	12.75	300	323.8
14	14.00	350	355.6
16	16.00	400	406.4
18	18.00	450	457
20	20.00	500	508
24	24.00	600	601