



ASME CODE NEWS

By Tom Pastor, Director, Engineering Technology Division

Questions and Answers

Q My company supplies vessels incorporating a flanged immersion heater as one of the end closures. Is this item exempt from Section VIII, Division 1 scope per U-1(e)(1)(c), where the vessel boundary is defined to end at the face of the first flange?

A The answer is no, since U-1(e)(1) addresses vessel boundaries where connections are made to piping. The flanged immersion heater is considered a permanent pressure-retaining cover made up of a combination of standard and proprietary parts. The blind flange is a standard part within the scope of the Code and covered by Code. The ASME B&PV Committee published an interpretation a few years ago on the subject of flanged immersion heaters, reproduced below:

Interpretation: VIII-1-95-128

Subject: Section VIII, Division 1 (1995 Edition); U-1 and UG-11

Date Issued: October 24, 1996

File: BC95-396

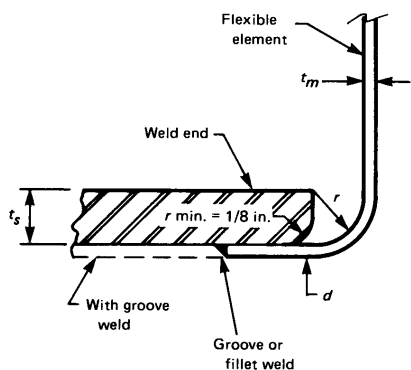
Question 1: Are flanged immersion heater assemblies (electric heater elements which are welded, pressed, or soldered into a bolted closure) which act as one of the main closures of a pressure vessel considered to be within the scope of Section VIII, Division 1?

Reply 1: Yes.

Question 2: Are the heater elements themselves exempted from the scope of Section VIII, Division 1 as proprietary fittings per U-1(e)(4)?

Reply 2: Yes.

Q Paragraph UW-3 of Section VIII, Division 1 defines weld joint categories for most joints in a vessel. When employing a bellows-type expansion joint in a vessel, is the attachment joint to the shell, as reproduced below from Appendix 26, assigned a Category?



A Bellows-to-shell attachment joints are not Categorized in UW-3. Therefore, the radiography rules of UW-11 and UW-12 do not apply, and these joints have no effect on the joint efficiency of the shell. The reason is that expansion joints designed per Appendix 26 do not carry the axial loads due to pressure; Appendix 26 26-1(b)

requires "adequate restraint elements." In addition, Appendix 26, 26-5 specifies the examination requirements for expansion joint welds.

Q I have heard that one of the reasons for a lower design temperature limit (approximately 900 deg. F or less) in Section VIII, Division 2 is that the fatigue design curves do not account for elevated temperature behavior. This being the case, if a vessel being constructed to Section VIII, Div. 2 is not subject to cyclic loading conditions, can it be designed to a temperature higher than the maximum listed in the allowable stress tables?

A The answer is yes: by invoking Code Case 1489-2. This code case will permit the use of Section VIII, Division 1 stress allowables at the higher temperatures as long as the part or vessel is exempt from fatigue analysis by the provisions of AD-160.1 and this exemption is stated on the User's Design Specification.

Final Word

Following are recent ASME Boiler and Pressure Vessel Code items of interest.

Code Case 2260 - Alternative Rules for Design of Ellipsoidal and Torispherical Formed Heads for Section VIII, Division 1 Vessels

This code case, and Case 2261 for Section VIII, Division 2, represents a lengthy effort to develop more accurate design rules for ellipsoidal and torispherical formed heads. Early efforts focused on analytically verifying that the controlling failure mode for formed heads is plastic collapse. Rules based on a limit on plastic collapse required increasing head thicknesses by as much as 25%. Not surprisingly, there was much opposition to making heads thicker, considering the excellent service experience with heads designed to current rules. To resolve the impasse, testing was undertaken to see exactly what type of failure mode occurred when a formed head was pressurized to failure. The main conclusion of the test program was that plastic collapse was not an observable failure mode, and therefore rules based on a collapse pressure criterion were not warranted. Instead, these code cases contain rules that satisfy burst and low-cycle fatigue criteria to design formed heads. In most cases, these new rules result in thinner heads as shown below:

SECTION VIII, DIVISION 1 MAWP COMPARISON (psi)					
t/L	r/D	SS 304		SA-516-70	
		Existing Rules	Case 2160	Existing Rules	Case 2160
0.002	0.06	43	39	40	39
0.002	0.17 ¹	68	75	63	70
0.01	0.06	212	267	198	248
0.01	0.17 ¹	338	376	314	350
0.02	0.06	425	602	395	560
0.02	0.17 ¹	674	752	628	700

¹ Equivalent Ellipsoidal Head

(t = head thickness, L = crown radius, r = knuckle radius)

These code cases are currently being balloted, with an expected approval date of late May, 1998. Please contact ASME Code & Standards at (212) 705-8533 for the latest status or to order copies of the code case.

Change in Design Margin - Sections I and VIII, Division 1

As reported in the last *Pressure Points*, efforts are underway to reduce, from 4.0 to 3.5, the design margin on tensile strength, which is used to establish allowable stresses. For most ferritic steels this will result in an increase of about 12.5% in allowable stresses listed in Section II, Part D.

Section I has now joined Section VIII in developing code cases to implement these revisions. These cases have gone through several rounds of voting in the past six months, but have not yet achieved final approval. They will again be voted on May 1 at the B&PV Main Committee. If approved, an early July, 1998 implementation date is anticipated. Your Authorized Inspector will keep you informed on the status of these code cases.

Joint Efficiencies and Weld Quality

We are seeking participants for a parametric study we are undertaking of the relation between joint efficiencies, weld quality and failure modes for

ASME Section VIII, Division 1 vessels. We intend to perform some initial scoping analyses to study the actual benefits of the present radiography rules related to design factors and probable failure modes. Alternatives will be considered if the study seems to warrant it.

We need actual data to begin this study. For a given vessel (or series of similar vessels), the following information is required:

1. Total footage of welds in groups classified by code category (UW-3) and type (UW-12).
2. General description of vessel(s) - length, diameter, head type(s).
3. Material thickness.
4. Material specification
5. Welding process(es) and whether manual or automated.
6. Actual flaws found - including type, dimension and, if possible, orientation. All flaws should be reported, even those not rejectable by current code rules.

If you are interested in participating, please e-mail Gene Feigel at richard_feigel@hsb.com. Any data provided will be held in strictest confidence.

TAKING CARE

EPA Finally Releases Position on ISO 14000

By Jill Smolnik, Director of Marketing and Domestic Business Development

For years, U.S. industry and environmentalists have anxiously awaited what position the Environmental Protection Agency (EPA) would take regarding environmental management systems (EMS) such as ISO 14000. On March 6, the Deputy Administrator of the EPA released the EPA's position paper regarding EMS and their affect on industry.

The International Organization for Standardization (ISO) finalized the ISO 14001 EMS standard in 1996 and people have been speculating ever since regarding the impact it would have on the EPA and the environmental community at-large. Optimists hoped that those companies certified to an EMS would be looked upon favorably by the EPA, resulting in fewer EPA audits, more autonomy and self-control, as well as lower operating costs.

Pessimists felt that companies would go through all of the pains of certification to an EMS, only to have the EPA disregard it and conduct "business as usual."

The EPA's position is that they will "support and will help promote the development and use of EMSs, including those based on the ISO 14001 standard, that help an organization achieve its environmental obligations and broader environmental goals." Currently they are not basing any regulatory incentives solely on the use of EMSs or certification to ISO 14001.

The Commission for Environmental Cooperation (CEC) Council issued a resolution concerning future cooperation regarding environmental management systems and compliance. They suggested that governments should retain the primary role in establishing environmental standards and verifying and enforcing compliance with laws and regulations. They also recommended that information be collected to evaluate the effectiveness of EMSs in the following areas:

- Environmental Performance
- Compliance
- Pollution Prevention
- Environmental Conditions
- Costs/Benefits to Implementing Facilities
- Stakeholder Participation and Confidence

For now, ISO 14000 remains in an evaluative, wait-and-see mode. Over 100 companies in the U.S. have been certified to the EMS, and there is no reason to believe it will stop.

HSB Registration Services, through their partners AWM and QAS, can offer ISO 14001 certification services in the U.S and abroad. If you would like more information regarding ISO 14000 or the EPA Position Statement, please contact Dennis Palmer at 1-800-345-1122, extension 2357, or via e-mail at dennis_palmer@hsb.com.

AROUND THE WORLD

European Pressure Equipment Directive Implementation Schedule Released

By Rolf Bjork, Director of International Business Development

The European Pressure Equipment Directive (PED), approved in May 1997, will be phased in over the next four years, eliminating mandatory compliance with local design codes for equipment exported to European Union (EU) member nations.

The milestones for the PED implementation are as follows:

3rd quarter 1999 Select European Inspectorates can become "EC Notified Bodies" for the PED. This accreditation authorizes these Inspectorates to perform design reviews and certify equipment for export to all 15-member nations of the EU.

November 29, 1999 The PED will go into effect on a 30-month interim basis. During this time, manufacturers should familiarize themselves with the Directive and begin the

transition to using the PED in lieu of local design codes. The CE Marking will be necessary whenever the PED requirements are completely followed.

May 29, 2002 The PED will fully replace the local design codes, making the CE Mark mandatory for all applicable equipment.

Manufacturers anticipating use of the PED can begin preparation for the November 1999 release by starting the development process for the Welding and NDE Procedures for Compliance with the applicable European Norms. HSB, in partnership with SAQ Kontroll AB of Sweden, can assist manufacturers in this preparation process and will also be available to provide the CE Mark.

For more information regarding the PED and CE Marking, please contact Bryce Hart by phone: 1-800-345-1122, extension 2364; fax: 1-610-962-7776; or e-mail: bryce_hart@hsb.com.

EDUCATIONAL SERVICES 1998 TRAINING SCHEDULE

For more information, call 1-800-626-4441, or visit the HSB website at <http://www.hsb.com>.

May 4 - 6	Process Piping, ASME B31.3 - API-570	Moncton, New Brunswick, Canada	\$ 650.00*	980527
May 12 - 13	Manufacturing Machines Operation and Maintenance	Hartford, Connecticut	\$ 530.00	980528
May 5 - 22	National Board Examination Preparation	Nashville, Tennessee	\$ 3,150.00	980530
May 18 - 22	API-570 Piping Inspector Examination Preparation	Nashville, Tennessee	\$ 1,200.00	980531
May 17 - 22	API-510 Pressure Vessel Inspector Examination Preparation	Nashville, Tennessee	\$ 1,200.00	980532
May 25 - 29	API-570 Piping Inspector Examination Preparation	Calgary, Alberta, Canada	\$ 1,200.00*	980533
June 8 - 9	Pressure Vessel Basic Design and Fabrication**	St. Louis, Missouri	\$ 565.00	980634
June 10	Repairs & Alterations to Boilers and Pressure Vessels	St. Louis, Missouri	\$ 250.00	980635
June 11 - 12	Section IX, Welding Qualifications	St. Louis, Missouri	\$ 530.00	980636
	Full week schedule; PV Design and Fab., Repairs, Section IX		\$ 1,075.00	980634-X
June 8 - 10	ASME Section I and B31.1	St. Louis, Missouri	\$ 650.00	980637
June 11 - 12	Basic NDE Methods	St. Louis, Missouri	\$ 530.00	980638
	Full week schedule; ASME Section I and B31.1 and Basic NDE		\$ 925.00	980637-X
June 8	ISO 9000 Overview and Transition from ASME to ISO	St. Louis, Missouri	\$ 250.00	ISO07
June 9 - 10	ISO 9000 Quality Manual and Procedure Development	St. Louis, Missouri	\$ 450.00	ISO08
June 11	Understanding Foreign Boiler and Pressure Codes	St. Louis, Missouri	\$ 250.00	ISO09
July 13 - 14	Introduction to Section VIII Div. 1	Milwaukee, Wisconsin	\$ 530.00	980739
July 15	Repairs & Alterations to Boilers and Pressure Vessels	Milwaukee, Wisconsin	\$ 250.00	980740
July 16 - 17	Section IX, Welding Qualifications	Milwaukee, Wisconsin	\$ 530.00	9804741
	Full week schedule; Intro. to Section VIII, Repairs, Section IX		\$ 1,050.00	980739-X
July 13 - 15	Process Piping, ASME B31.3 - API-570	Milwaukee, Wisconsin	\$ 650.00	980742
July 16 - 17	Basic NDE Methods	Milwaukee, Wisconsin	\$ 530.00	980743
	Full week schedule; Process Piping and Basic NDE		\$ 925.00	980742-X
August 11 - 28	National Board Examination Preparation	Charleston, South Carolina	\$ 3150.00	980844
September 14 - 15	Introduction to Section VIII Division 1	Williamsburg, Virginia	\$ 530.00	980945
September 16	Repairs & Alterations to Boilers and Pressure Vessels	Williamsburg, Virginia	\$ 250.00	980946
September 17 - 18	Section IX, Welding Qualifications	Williamsburg, Virginia	\$ 530.00	980947
	Full week schedule; Intro. to Section VIII, Repairs, Section IX		\$ 1,050.00	980945-X
September 21 - 25	API-653 Above Ground Storage Tank Examination Preparation	Edmonton, Alberta, Canada	\$ 990.00*	980948
September 29-30	Manufacturing Machines Operation and Maintenance	Hartford, Connecticut	\$ 530.00	980949
October 12 - 13	Introduction to Section VIII Division 1	Reno, Nevada	\$ 530.00	981050
October 14	Repairs and Alterations	Reno, Nevada	\$ 250.00	981051
October 15 - 16	ASME Section IX, Welding Qualifications	Reno, Nevada	\$ 530.00	981052
	Full week schedule; Intro. to Sec. VIII, Repairs, Section IX		\$ 1,050.00	981050-X
October 12 - 14	Process Piping, ASME B31.3 - API-570	Reno, Nevada	\$ 650.00	981053
October 15 - 16	Basic NDE Methods	Reno, Nevada	\$ 530.00	981054
	Full week schedule; Process Piping B31.3 and Basic NDE		\$ 925.00	981053-X
October 26	ISO 9000 Overview and Transition from ASME to ISO	Reno, Nevada	\$ 250.00	ISO10
October 27-28	ISO 9000 Quality Manual and Procedure Development	Reno, Nevada	\$ 450.00	ISO11
October 29	Understanding Foreign Boiler and Pressure Codes	Reno, Nevada	\$ 250.00	ISO12
October 19 - 20	Introduction to Section VIII Division 1	Montreal, Quebec, Canada	\$ 530.00*	981055
October 21	Repairs and Alterations	Montreal, Quebec, Canada	\$ 250.00*	981056
October 22 - 23	ASME Section IX, Welding Qualifications	Montreal, Quebec, Canada	\$ 530.00*	981057
	Full week schedule; Intro. to Sec. VIII, Repairs, Section IX		\$ 1,050.00*	981055-X
October 26 - 28	Process Piping, ASME B31.3 - API-570	Montreal, Quebec, Canada	\$ 650.00*	981058
October 29 - 30	Basic NDE Methods	Montreal, Quebec, Canada	\$ 530.00*	981059
	Full week schedule; Process Piping B31.3 and Basic NDE		\$ 925.00*	981058-X
November 3 - 20	National Board Examination Preparation	San Diego, California	\$ 3,150.00	981160
November 16 - 20	API-570 Piping Inspector Examination Preparation	Los Angeles, California	\$ 1,200.00	981161
November 9 - 13	API-570 Piping Inspector Examination Preparation	Calgary, Alberta, Canada	\$ 1,200.00*	981162
November 8 - 13	API-510 Pressure Vessel Inspector Examination Preparation	Calgary, Alberta, Canada	\$ 1,200.00*	981163

*Prices are in U.S. Dollars ** ASME Section VIII Division 1 Pressure Vessels

ENGINEERING SERVICES S O L U T I O N S

Engineering Services provides the following services to clients around the world:

- **ASME Codes and Standards Services** provides authorized inspection services to boilers, pressure vessels, nuclear components, and process and power plants. Services also include pressure vessel and piping design, finite element analysis, and quality assurance program development. Contact Keith Burns, 630-955-1866, extension 5604 or via e-mail at keith_burns@hsb.com.
- **HSB Registration Services** provides document reviews, pre-audits, certification audits, and registration to ISO 9000 quality system management standards, QS-9000 requirements (automotive-focus), and ISO 14000 environmental management systems standards (through partnerships with AWM, US and QAS, Australia). Contact Sam Corona, 770-716-9773.
- **Pressure Equipment Technologies** provides comprehensive engineering surveys of critical plant equipment designed for pressure service such as boilers, deaerators, paper machine dryers, general service pressure vessels, and piping systems. Contact Joe Hoyt, 309-829-9551.
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- **Technical Resource Support** provides independent and objective analyses of equipment, processes, and systems through the following services: vendor surveillance, third-party inspection, expediting, auditing, and project management. Contact Bryce Hart, 610-962-2364, or via e-mail at bryce_hart@hsb.com.

For more information on Engineering Services, contact:

- Consultant, Engineering Services
Bernie Hrubala, 800-472-1866 extension 5651
- Sales Director, Engineering Services
Ray Withey, 800-681-9095 extension 6404.

Do you have a question or topic suggestions for future issues?
Contact Jill Smolnik in Hartford, CT at 800-472-1866, extension 5294, or via the Internet at jill_smolnik@hsb.com.

READ PRESSURE POINTS ON THE WEB

You can also find current and past articles from Pressure Points on The Hartford Steam Boiler Inspection and Insurance Company's web site. Go to www.hsb.com, and click on the Engineering icon. In addition to information about HSB's many engineering services, this section includes an electronic version of Pressure Points.

P R E S S U R E P O I N T S

The Quarterly Newsletter of Engineering Services



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