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The ASME HPS-2003 Standard Can Increase Safety and Lower Risk

The new ASME Standard HPS-2003 gives an added dimension of safety and reliability provided by the ASME Boiler and Pressure Vessel Code, particularly to users of Section VIII of the Boiler Code and ASME B31.3 - Chemical Plant and Petroleum Refinery Piping Standard. Section VIII does not set a limit on the pressure that a vessel could be designed by its provisions, but notes that special considerations may be necessary for "very high pressures".

The HPS - 2003 standard is a unique standard: it is a pressure "system" safety standard that includes (but is not limited to) the vessels, pipes, fittings, compressors, intensifiers, limiting devices, instrumentation and controls, working fluid or medium, and protective systems. The HPS-2003 standard considers, within its scope, pressure systems at pressures above 10,000 psi but is not limited thereto. The HPS-2003 is unique, not only because it considers a particular pressure system, but also a specific location or site with personnel.

According to Sam Brown, vice chairman of the HPS-2003 committee, the HPS 2000 standard can compliment pressure components standards other than the ASME Boiler and Pressure Vessel Code such as other ANSI pressure system standards (ANSI/API, ANSI/NFPA, ANSI/NPS, ANSI/UL, ANSI/RMA, to name a few) as well as state and federal codes [for example, the Code of Federal Regulations - 29 CFR 1910 (OSHA) and EPA (Environmental Protection Agency) statutes] and other association guidelines such as those promulgated by the AIChE for the chemical industry.

Don Fryer, chairman of the HPS committee, points out that the HPS-2003 consists of six sections which provide descriptions and measures for preventing potential hazards from pressure systems: Introduction, Hazards in High Pressure Systems, General Requirements, High Pressure Components, Operation and Maintenance, Hazardous Release Protection.

Like the ASME Boiler and Pressure Vessel Code that was started in 1915 as a response to numerous pressure systems explosive failures in the 19th century, the HPS-2003 was a response to a similar motivating issue: pressure system safety for personnel and property loss.

An illustration of the destructive potential of high pressure systems is given in Figure 1. This figure shows the 33,000 pound fragment from a 140-ton HIP (hot isostatic) pressure system operating at 15,000 psi and

Figure 1.

1650^{o}F that failed catastrophically. The fragment traveled approximately 700 feet from the pressure vessel to beyond the plant boundary. Sam Brown discusses this and other pressure systems failures in the ASME PVPD-41 Tutorial on the ASME HPS Section 6000 (illustrating fatalities and economic losses from the millions to billions of dollars).

By way of background to the origins of the HPS-2003 Standard, in the 1970's, the subcommittee on high pressure technology of the OAC (Operations Applications Compo nents) committee of the ASME Pressure Vessel and Piping Division petitioned the ASME Council on Codes and Standards to form a standards committee to prepare a high pressure systems standard that addresses the establishment of performance criteria and protection criteria for pressure systems. A risk-based criterion was provided as a basis for determining if the system design application (siting) exceeds or needs improved reliability for the safety of personnel.

CONTENTS

ASME International

continued on page 2

Sections 1000 - 5000, General, provides pressure systems: scope; hazards causes; owner, designer, fabricator, installer responsibilities; selection of equipment; component material selection; component protection; inspection, installation, testing records; safety program (training); plans and manuals; over-pressure/temperature protection.

Section 6000 Hazardous Release Protection, of the HPS-2003 standard, requires the user to identify if there are hazards present in the pressure system to people (equipment are optional). If hazards are present, the user is to estimate the magnitude of the hazards and next determine the criticality ranking or severity consequences to personnel (and equipment loss) and the probability the event will occur. The HPS-2003 provides a risk-based criterion to assess the pressure system internal and external kinetic energy and degenerative hazards. It permits a number of ways to lower risk to personnel and structures [e.g., redesign of the pressure system, protection (reduction of consequences), improved inspection (reduction of event probability), etc.]. See Figure 2. The types of hazards considered are: pressure waves, missiles, foundation motion, radiant heat/fireballs, fire, biological effects, chemical effects, and ionizing radiation.

The methods for hazards identification, magnitude, effect on personnel and equipment, severity/criticality consequences (injury, costs, etc.), and probability can be as simple as a FEMA (failure modes and effects analysis) tabulation with historical data for simple systems or computer generated fault tree (or event tree) analysis for more complex systems. HPS-2003 helps to determine if and where a pressure system has risks (consequences times event probability) that may need to be eliminated or reduced.The ASME HPS-2003: High Pressure Systems standard is $89.00. To purchase a copy, go to http://www.asme.org/catalog, or call 1-800-THE-ASME. Refer to Order # A14003.

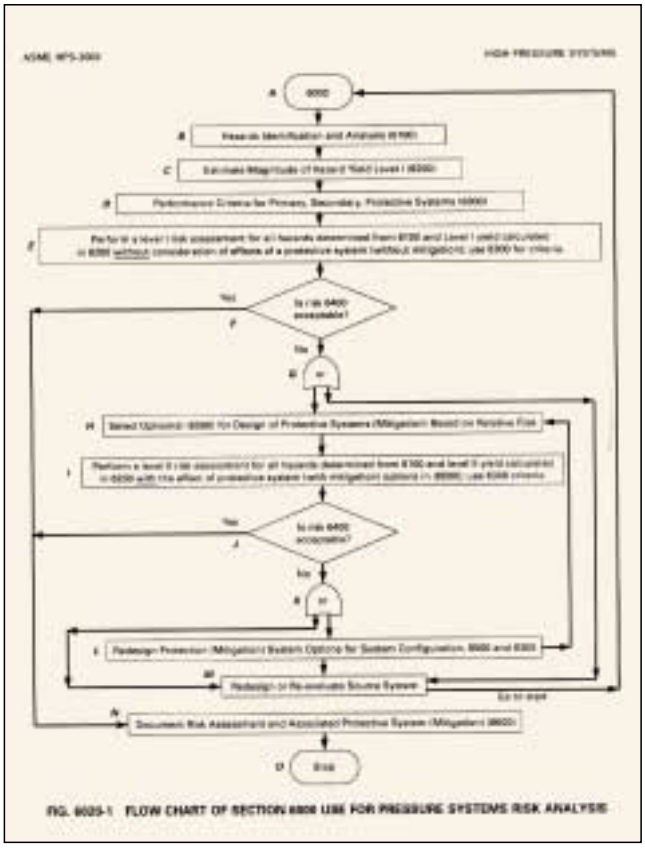

Figure 2.

SC-BPVA Interpretation on Manuals for Multiple Locations

Question: *Is it permissible to have one Quality Control System (Corporate) Manual established and implemented, for ASME Accreditation, at more than one location owned by the same company?*

Reply: No.

Rationale: The reply has always been "No" for ASME non-nuclear boiler and pressure vessels activities based on the following:

1. ASME has no Corporate Certificates of Authorization for non-nuclear boiler and pressure vessels activities. ASME code requires each plant to have a separate Certificate of Authorization and demonstrate a Quality Control System to establish that all Code requirements, including material, design, fabrication, examination, inspection of boilers/pressure vessels or parts, pressure testing, and certification will be met.

2. In order to obtain an ASME Certificate of Authorization, the Manufacturer is required to have and maintain a quality control system that describes the Code activities, who is responsible and how the Code activities will be controlled for each location.

Listed below are some questions and replies to help understand this requirement:

Question 1: *A company owns several plants fabricating pressure vessels with each plant having its own ASME Certificate of Authorization. The main office of this company is where engineering is located and establishes the quality control system manual for implementation at each plant. The quality control system manual covers the requirements that are the same at each location and an appendix to cover the specific details for that plant. Is this acceptable?*

Reply 1: Yes, but the quality control system manual plus addenda are subject to acceptance, at each location, by the AI and during the joint review by the ASME Review Team.

Question 2: *A Company owns several plants fabricating pressure vessels with each plant having its own ASME Certificate of Authorization. The main office of this company is where engineering is located and establishes the quality control system manual for implementation at each plant. The quality department wants to implement the same quality control system at each location. This company wants one AI to accept the quality control system manual to be used at all locations, even those there is a different AI servicing each location. Is this acceptable?*

Reply 2: No. The AI for each location must accept changes to the quality control system manual and during the renewal of the ASME Certificate of Authorization; the quality control system manual is subject to review and acceptance by the ASME Review Team.

ASME BPV Stamp Holder *ECR International* Brings ISO 9001: 2000 and ASME BPV Accreditation Together

ASME International is an accredited ISO 9000 Registrar. If you are an ASME stamp holder you can save time and money by combining ISO 9001:2000 registration with ASME's shop review. This means that stamp holders can take advantage of a simplified quality system (one manual or two....it's your decision), significantly reduced audit/review time (one shop review/ISO assessment combined), quality management consistency, and the potential of eliminating unnecessary cost of implementing and maintaining their quality system certificates. You can either request an early renewal of your accreditation, or apply for ISO9000 Registration at the time of your next scheduled renewal.

ECR International of Dunkirk, NY took advantage of this opportunity and found the experience rewarding. Bill Harford, Director of Quality for ECR International told ASME about their experience:

ASME: Please give us a small description of what your company does and some background to your experience with ASME and the ISO 9000 registration process.

Bill Harford: *"As Director of Quality for ECR International I found the ASME's new program very convenient, effective and economical. ECR is a manufacturer of a variety of HVAC products, from boilers and furnaces, to package and split system air conditioners. We operate four ISO certified facilities, two of which are H stamp holders, each dedicated to the design and manufacturing of these products for our own distribution as well as our OEM customers. We have long recognized the benefits of our ISO 9001 certifications to ourselves, and our customers. What started in a single facility was quickly set in place throughout the corporation, giving us what we feel is, a strategic advantage."*

ASME: What were the advantages to having both ISO registration and BPV accreditation performed by ASME?

Bill Harford: *"When we made the commitment to go after our ISO9001 certification back in 1998 we had already had decades of experience with the ASME because of our H stamp certification, and thought it not only the most logical choice, because of their experience with our organization, but the most appropriate choice, because of the ASME's expertise and reputation, particularly in the hydronic heating business. The convenience of having both the ASME section IV and the ISO9001 audits done at the same time was quickly recognized by the ASME accreditations manager and offered to us as a package. Beyond the immediate savings we realized because we had been paying travel expenses for two separate audits, it was less of a time and logistical challenge for our personnel. An added benefit we found was a better understanding of both similarities and differences in the two standards, which enabled us to combine some parts of the systems."*

ASME: How did the ASME Team conduct the review and assessment? For example...were they easy/pleasant to work with? Knowledgeable and fair?

Bill Harford: *"The consensus within ECR International is that the ASME team is knowledgeable, but down to earth, tough, but fair, and professional, but personable. Their knowledge of our business and experience over the years make them a very effective team. The audit reports are well written and useful in content. The corrective actions, yes, we had a couple of minor opportunities for improvement, were direct and constructive. All and all, a very productive experience."*

To obtain the ASME ISO 9001:2000 application forms, or for further information go to: http://www.asme.org/cns/accreditation/ or email: nothoferw@asme.org.

8TH NRC/ASME Symposium on Valve and Pump Testing

July 12-14, 2004 at Washington D.C

The U. S. Nuclear Regulatory Commission (NRC) and the American Society of Mechanical Engineers (ASME) will jointly sponsor the 8th NRC/ASME Symposium on Valve and Pump Testing on July 12 to 14, 2004, in Washington, DC, at the Renaissance Washington DC Hotel. The hotel is located across from the Washington Convention Center, midway between the Capitol and the White House, and is near the MCI Center, Smithsonian museums, National Galleries and the Kennedy Center for the Performing Arts.

This Symposium is conducted every two years to provide for the exchange of information on technical, programmatic, and regulatory issues associated with the testing of valves and pumps used in nuclear power plants. The audience will have an opportunity to discuss ideas and ask questions during the technical sessions.

For more information go to: http://www.asme.org/cns/departments/nuclear/8symposium/

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ACCREDITATION PROGRAMS

AIA Qualification of Authorized Inspection Agencies, nuclear and non-nuclear, based on the ASME QAI-1 Standard (formerly N626.1)
Bibi Rahim, 1-212-591-8585, rahimb@asme.org & Ken Baron, 1-212-591-7019, baronk@asme.org

BPV Boiler and Pressure Vessels
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N-type Nuclear component manufacturers and assemblers (vessels, tanks, pressure piping, and pressure relief devices)
Bibi Rahim, 1-212-591-8585, rahimb@asme.org & Maria Tromba, 1-212-591-8586, trombam@asme.org

PRD Pressure relief device testing laboratories and authorized observers
Joseph Pang, 1-212-591-8525, pangj@asme.org; Sandra Bridgers, 1-212-591-8583, bridgers@asme.org; Ken Baron, 1-212-591-7019, baronk@asme.org

QEI Elevator Inspector certifying organizations
Bibi Rahim, 1-212-591-8585, rahimb@asme.org & Joseph Pang, 1-212-591-8525, pangj@asme.org

QSC Nuclear material organization (material manufacturers and suppliers)
Bibi Rahim, 1-212-591-8585, rahimb@asme.org & Maria Tromba, 1-212-591-8586, trombam@asme.org

RTP Manufacturers of reinforced thermoset plastic corrosion resistant vessels
Bibi Rahim, 1-212-591-8585, rahimb@asme.org & Maria Tromba, 1-212-591-8586, trombam@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
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CERTIFICATION OF PERSONNEL

QHO Operators of hazardous waste incinerators
Sandra Bridgers, 1-212-591-8583, bridgerss@asme.org & Maria Tromba, 1-212-591-8586, trombam@asme.org

QRO Operators of resource recovery facilities processing municipal solid waste (MWCs)
Sandra Bridgers, 1-212-591-8583, bridgerss@asme.org & John Millman, 1-212-591-8584, millmanj@asme.org

QFO Operators of high capacity fossil fuel fired plants
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Y14 Geometric dimensioning and tolerancing professionals (GDTP)
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