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ASME STANDARDS TECHNOLOGY, LLC

Code Comparison Project

ASME • AFCEN • JSME • KEA • CSA • NIKIET

Status Report

MDEP CSWG Meeting
Paris, France
15-16 September 2011

History / Background

- ASME Standards Technology LLC (ASME ST-LLC) is managing the Code Comparison Project, which was initiated in response to a request by the Multinational Design Evaluation Program (MDEP) Working Group on Component Manufacturing Oversight (WGCMO).
- In an effort to facilitate as much as possible the consistent design and manufacturing processes between the ten MDEP countries for Class 1 components for nuclear power plants, WGCMO requested the Standards Development Organizations (SDOs) to develop a comparison of the requirements of their codes and standards.
- In view of the fact that years ago the ASME was the source of the codes to be compared, it was determined that the format of the comparison should be based on the ASME sections.

Scope / Objective

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- The scope of this project is to perform a detailed comparison of the AFCEN, JSME, KEA, CSA, and NIKIET Codes against the ASME Section III Code.
- Class 1 components only are being compared, including pressure vessels, piping, valves and pumps. Work has been initiated to expand the comparison to include Class 2 components.
- The objective of this effort is to identify the differences between the codes being compared.
- An agreement was signed by ASME, AFCEN, KEA, JSME, CSA, and NIKIET to participate in this effort.

Structure of the Report

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- A draft report has been prepared.
- General Information on Codes
  - SDO Background Information
  - General Layout of Each Code
- Five sections containing a discussion of each code compared to the ASME Code
- All of the comparison sections are organized in the same way and compare the codes in the same order as the paragraphs in ASME Section III Division 1.
- Appendix containing the comparison tables

Schedule for Publication of the Report

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- The draft report is in the final stages of review by the SDOs.
- An updated draft is expected to be submitted to the SDOs in October, for final comments.
- ASME will address all comments in November for final discussion in December.
- The SDOs will meet in Paris on December 4-5, in preparation for the meeting with the MDEP CSWG on December 6.

Differences

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- Regulatory requirements and limitations
  - Quality Assurance
  - Conformity Assessment
  - Allowable Stress Limits
  - Material selection
  - Design approval
  - Approved Notified Bodies
- Country standard industry practices
  - Welding qualification
  - Third party inspection
  - NDE personnel certification
  - NDE methods
  - Material specifications
- Compliance administrative requirements
  - Conformity Assessment
  - Stamping
  - Quality Assurance
  - Registered Professional Engineers
  - Authorized Inspection Agencies
  - Design Specifications
- Scope differences
  - Types of reactor designs
  - Material selection
  - Degree of detail specified
    - Attachments, Tolerances, Analysis, PWHT
  - Jurisdictional boundaries
  - Overpressure protection
  - Preservice Inspection

RCC-M
Significant Differences

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- Most of the differences between ASME BPVC Section III and RCC-M can be classified in two categories: differences due to technical requirements or differences due to regulatory requirements.
- For Class 1 vessels, the RCC-M is more specific for PWR reactors; ASME has a larger scope than RCC-M and requires Design Specifications.

RCC-M
Significant Differences

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- ASME Section III requires accreditation of fabricators, manufacturers, and suppliers, and qualification of professional engineers; RCC-M does not have similar requirements.
- ASME Section III specifies preservice examinations in accordance with ASME Section XI requirements; RCC-M allows use of Owner-specified requirements for preservice examination.
- QA in RCC-M is based on ISO-9001 and IAEA standards and recommendations; ASME specifies use of ASME NQA-1 with additional requirements.

JSME S-NC1
Significant Differences

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- JSME S-NC1 does not have requirements for quality assurance, however ISO-9001 is applied through regulatory and contractual requirements; ASME specifies use of ASME NQA-1 with additional requirements.
- ASME Section III requires evaluation of piping stresses due to seismic loads using an empirical formula. JEAC4601 (seismic code for Japan) requires fatigue analysis.
- Cutting, forming and brazing requirements are specified in Section III, but not in JSME S-NC1

KEPIC-MN
Significant Differences

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- Differences between KEPIC-MN and ASME Section III are largely related to differences in standard industry practice. They include differences in calibration standards and NDE personnel certification, for which KEPIC requires national certification based on Korean domestic law in addition to the requirements of ASNT SNT-TC-1A.

CSA N285-08
Significant Differences

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- Differences exist between CSA N285-08 and ASME Section III because of the difference in reactor design. ASME Section III was written for light water reactors; N285 was written for heavy water reactors.
- CSA has developed a series of standards (N289 Series) that identifies the Canadian requirements for considering the evaluation and impact of seismic loadings on the pressure boundary items.

NIKIET PNAE G-7 General Information

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- The scope of requirements in PNAE-G7 is much smaller than that of ASME Section III. Additional guidance is provided by standards from other organizations.
- PNAE-G7 provides technical requirements (standards) for fabrication of particular material product forms or particular parts or components.
- The specific feature of the standardization in the Russian nuclear sphere is the presence of a significant number of guidance documents and related standards. Therefore, requirements that are not specified in PNAE G-7 can be contained in the guidance documents and standards.

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