4TH MDEP CONFERENCE, SESSION 1:
"CODES AND STANDARDS HARMONIZATION"

SDO MECHANICAL CODES CONVERGENCE BOARD:

ACHIEVEMENTS & PERSPECTIVES

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London, UK

[1]Prepared by : AFCEN, ASME, CSA, JSME, KEPIC , ENES (NIKIET), and ASME ST LLC
ASME ST-LLC SERVES AS TECHNICAL SECRETARIAT OF SDO CONVERGENCE BOARD

Code Comparison Background

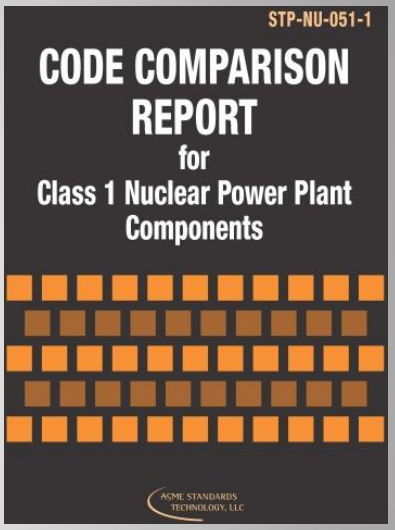
- In an effort to facilitate as much as possible the consistent design and manufacturing processes between the ten Multinational Design Evaluation Program (MDEP) countries for Class 1 components for nuclear power plants, Working Group on Component Manufacturing Oversight (WGCMO) requested the Standards Development Organizations (SDOs) from the USA, France, Japan, Korea, Canada and Russia 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
- ASME Standards Technology LLC (ASME ST-LLC) managed the Code Comparison Project

Code Comparison Objective

- The scope of this project was to perform a detailed comparison of the AFCEN, JSME, KEA, NIKIET and CSA Codes against the ASME Code
- Class 1 components only were being compared, including pressure vessels, piping, valves and pumps
- The objective of this effort was to identify the significant differences that would have an impact on designing and manufacturing a component in one country and using it in another country

SDO Board Background

- The Code Comparison Report has highlighted various differences in the national Codes, but most importantly it has identified:
  - many areas of differences connected for different reasons: national regulation, non nuclear industrial practices, scope of codes, technical requirements equivalent but not identical ,



SDO Board Background

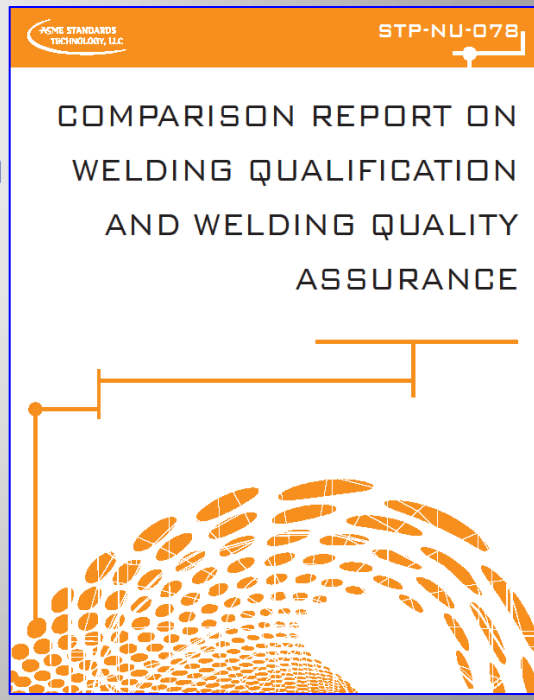
- After this positive experience, the SDOs agreed to maintain their exchanges, and created "Standards Development Organization Mechanical Codes Convergence Board", with a list of members and a Charter. The Board meets approximately 3 times a year at the beginning of the ASME Code week. The secretariat was assumed by ASME ST-LLC, supported by a grant from US NRC in the last years.

- The Board is currently comprised of:
  - AFCEN
  - ASME
  - CSA
  - ENES-NIKIET
  - JSME
  - KEA (KEPIC)
  - Observer: WNA/Cordel **M**echanical **C**ode & **S**tandard **T**ask **F**orce (MCSTF)

  Other SDOs are invited to join the SDO board in the future.

Welding Qualification one example of recent realization

- SDO have decided to initially pursue the following area of convergence: Welding Qualification and Welding Quality Assurance
- ASME ST-LLC contracted World Nuclear Association (WNA) to develop a Comparison Report on Welding Qualification and Welding Quality Assurance
- Experts in the MCSTF of CORDEL (Mechanical Codes and Standard Task Force of Cooperation in Reactor Design Evaluation and Licensing, dedicated working group of WNA) approved the report.
- ASME ST-LLC published the Comparison Report on Welding Qualification and Welding Quality Assurance (STP-NU-078) in the ASME online catalog as an ASME ST-LLC Standards Technology Publication



SDO Board Charter

- The SDO Convergence Board was formed to achieve the following objectives for Nuclear Power Plant Codes and Standards:
  - Limit divergence on individual requirements
  - Achieve convergence on individual requirements, where realistic and practical
- The SDO Convergence Board collaborates with Code and Standards Working Group (CSWG) of MDEP, CORDEL and other global stakeholders (VICWG) to identify and facilitate implementation of activities leading to nuclear code convergence and minimization of code divergence.

Experience feedback of SDO Board operation

- Code harmonization is difficult when each Regulator has its own requirements, and demonstration depends on the regulation in force in the licensing country,
- However comparison works are useful, and allow to improve the codes
- Divergence can be limited. For example, for NDT/NDE qualifications, the recent ANDE* is not far to the convergences proposals made by MCSTF of CORDEL

ANDE*: Asme Non Destructive Examination personal qualification (New) process

What is possible in 2017, 2018, 2019?

- SDO Board launched a qualitative survey to all SDOs for prioritization of new potential convergence topics.
- After the meeting in November 2016 and May 2017 (ASME, AFCEN, JSME, KEPIC), the topics under discussion are:
  - Fatigue
    - Various development works presented by SDOs (fatigue design curves, environmental effects, …)
    - Ongoing code comparison carried out by CORDEL ➔ for review and consideration by SDOs
    - Roadmap prepared by ASME and presented to SDO Board in May 2017, for information
  - Nozzles design rules analysis
    - Ongoing benchmark including non-linear analyses led by CORDEL
    - Results and recommendations to be presented ➔ for consideration by SDOs
  - Treatment of FEA (Finite Elements Analysis) results without stress classification
    - Need for detailed description (scope, objectives, work plan) ➔ for discussion by SDOs
    - Resources to be identified to develop work plan
- Other topics on material, fabrication, examination or QA, could be also considered
- It is possible to define a 3 years program, according to the results of the SDO survey and the MDEP-CSWG support

SDO Board further activities

- Are subject to confirmation by MDEP of the usefulness and relevance of the upcoming work
- SDO Board will continue to meet regularly
  - to support codes comparison and follow progress of works
  - will collaborate with WNA/CORDEL MCSTF
  - will act as a forum for an international exchange of information
- SDO Board proposes to maintain the yearly meeting with MDEP/CSWG to present progress of work with following objectives
  - November 2017 : preliminary list of topics for 3 year program
  - November 2018 : presentation and review by MDEP/CSWG of the final 3 year program

As a conclusion

The future success of the SDO Convergence Board will depend on:

- close support from MDEP/CSWG
- confirmation by MDEP /CSWG of the usefulness and relevance of the up-coming 3 years roadmap

Thank you for your attention