

Codes and Standards for Small Modular Water Reactors

Neil Ray

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Outline

- Background
- Current ASME activities for SMRs
- Discussion Topics

Background

- Questions raised by participants during 2011 NRC Regulatory Information Conference:
 - Do Section III and Section XI fully support the plans for construction and operation of the new small modular reactors (SMR)?
 - What ASME Codes and Standards (new or modified) are needed to support integral pressurized water reactors (iPWRs)?

Background

- NRC regulations currently require light water reactors to meet ASME B&PV Code for design and inservice inspection
- Current Codes and Standards were developed to address operating large light water reactors
- Proposed iPWRs have some unique design features

Background

- Preliminary information on iPWRs:
 - Most Nuclear Steam Supply Systems (NSSS) are inside the reactor vessel
 - Piping systems inside the reactor vessel may be less than 2 in diameter pipe
 - Other safety systems piping are likely to be less than 4 in diameter piping
 - Inspection accessibility inside the RV may be a challenge
 - Refueling time varies from 24 months to 4 years

Discussion Topics

- ASME Section III, Section XI do not address reactor vessel internals except for core support structures
- Industry and NRC are currently addressing issues of reactor internals for large light water reactors, for example,
 - Irradiated assisted stress corrosion cracking (IASCC)
 - Void swelling
 - Stress relaxation
 - Periodic inspection of internals
 - Flow induced vibration

Discussion Topics

- Currently, piping under 2 in diameter uses socket welds and does not require ASME Class 1 analysis, for example fatigue qualification
- Piping under 4 in diameter does not require Section XI inservice inspection
- Adequate access for ISI, especially for inside the RV
- ISI frequency considering proposed refueling in every 24 months to 4 years