ASME/NRC Semi-Annual Management Meeting

Rewrite of Section XI, Division 2, Using Risk-Informed Methodology

Reliability and Integrity Management (RIM)

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August 17, 2012

ASME
SETTING THE STANDARD

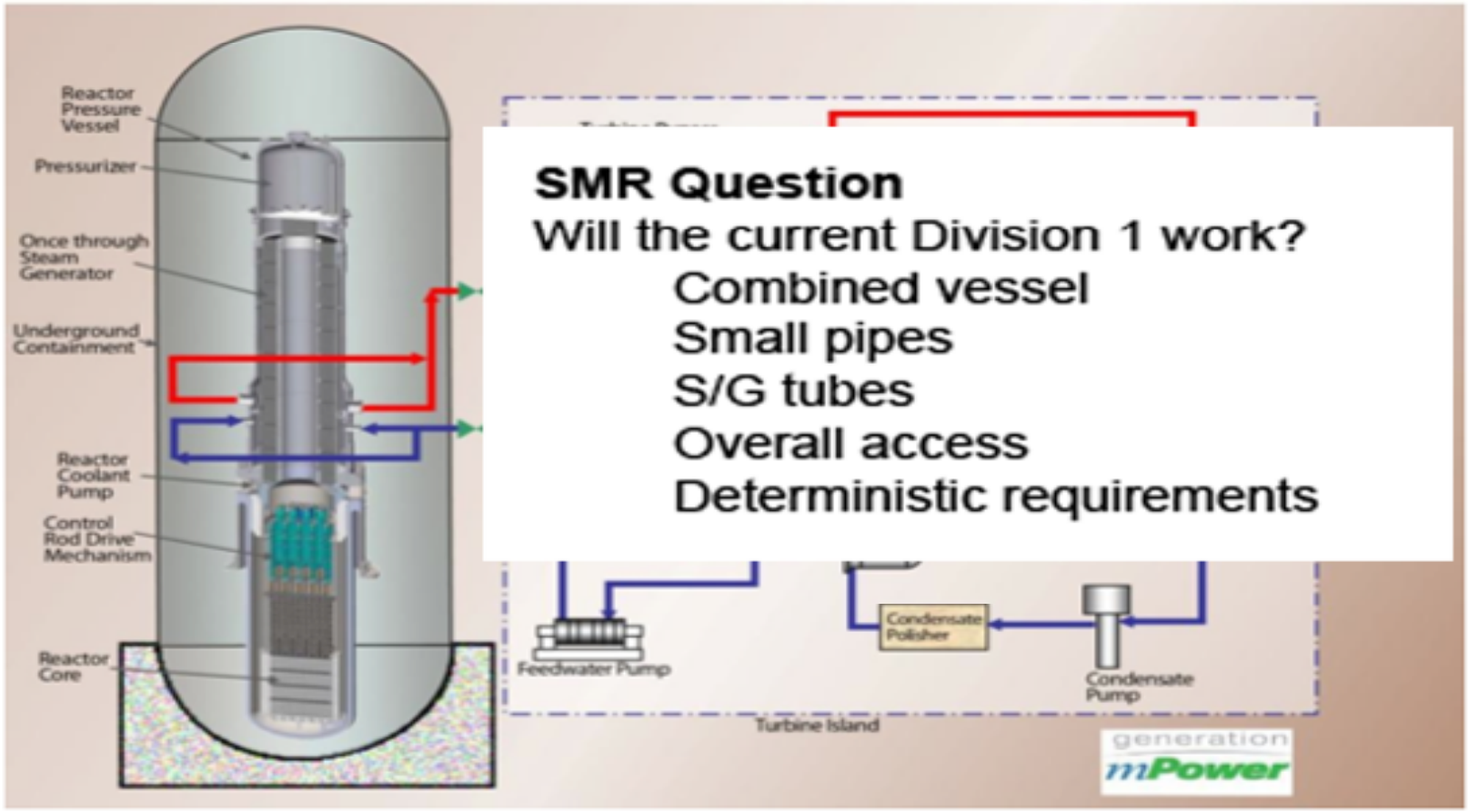
Pebble Bed Modular Reactor (PBMR) Leads to New Program

- 2003 – ASME visited PBMR in South Africa (RSA)
- 2004 – ASME began rewriting Section XI, Division 2
- New Basis for Section XI, Division 2
  - Incorporate experience with risk-informed inservice inspection (ISI) of light-water reactors
  - Translate water-cooled reactor experience to high-temperature gas-cooled reactors

New Program Redirected to New SMR/IPWR Designs

- 2010 – Section XI, Division 2 rewrite nearly complete, RSA pulls PBMR funding
- 2011 – Small, modular, integrated, pressurized water reactors (SMR/IPWR) came to forefront of design and licensing efforts

SMR/IPWR Inservice Inspection



PRA Standards for SMR/IPWR Designs

- 2011-2012 – ASME/ANS Joint Committee on Nuclear Risk Management (JCNRM) drafts joint Non-LWR Probabilistic Risk Assessment (PRA) Standard
- 2012 – Section XI redirects rewrite to new SMR/IPWR designs
- 2012 – Section XI requests JCNRM to reclassify Non-LWR Standard as Technology Neutral, for application to new SMR/IPWR designs (including water)

New Section XI, Division 2 Philosophy

RIM (Reliability and Integrity Management)

- Plant design, inservice inspection, online monitoring
- Appropriate level of reliability of SSCs
- Continuing assurance over the life of the plant that such reliability is maintained
- Design and inspection or monitoring features important to reliability
  - Design margins
  - Material selection
  - Maintenance, repair, replacement
  - Testing, monitoring, inservice inspection (ISI)

RIM (Reliability and Integrity Management)

- Expanded RIM Program Scope
  - Addresses more than plant safety
    - Investment protection
    - Beyond-design-basis-events
  - Precursor to new safety construct

RIM (Reliability and Integrity Management)

- Determine Scope of SSCs for RIM Program
- Evaluate SSC Damage Mechanisms
- Determine Plant and SSC Level Reliability and Capability Requirements (including beyond-design-basis events, if desired)
- Evaluate RIM Strategies to Achieve Reliability Targets
- Evaluate Uncertainties in Reliability Performance
- Determine Scope and Parameters of RIM Program
- Monitor SSC Reliability Performance and Update RIM Program

Current Div. 2 Rewrite Status

- RIM Format
  - RIM-1000 SCOPE AND RESPONSIBILITY
  - RIM-2000 RIM PROGRAM
  - RIM-3000 EVALUATION STANDARDS
  - RIM-4000 REPAIR/REPLACEMENT ACTIVITIES
  - RIM-5000 PRESSURE TESTING OR LEAKAGE MONITORING
  - RIM-6000 RECORDS
  - RIM-9000 GLOSSARY

Current Div. 2 Rewrite Status

APPENDICES

1. Plant Type
   - Water, Gas, Metal, Salt
2. Mandatory
   - Appendix I – TBD
   - Appendix II – U.S. Administrative Requirements
   - Appendix III – Owner's Reports
   - Appendix IV – NDE Personnel Qualification Program
   - Appendix V – Examination Requirements
   - Appendix VI – Decision Flow Charts