

Efficient Development of
Risk-informed Codes &
Standards for New Reactors

NRC RIC – Session W14

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Need for New and Modernized Codes & Standards



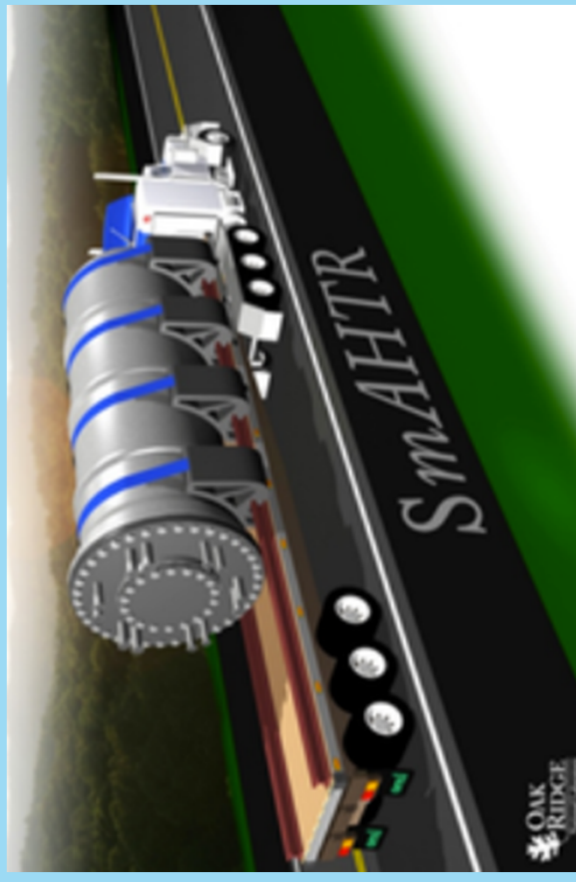
- *Enhanced safety, new materials & fabrication methods*, & needed *pace of deployment* necessitate heightened focus on codes and standards (C&S)
- Key NRC & industry actions
 - Participation in the development of new C&Ss
 - Expedited endorsement of critical Code Cases (CCs)
 - Use of risk insights to enable safety & cost effectiveness

NRC & industry support for C&Ss is critical for enabling efficient & timely deployment of new reactors

NRC Endorsement of ASME III Code Case N-883



- Manufacturing of components without an owner is restricted
- ASME III permits it for valves, pumps & supports < 4 in.
- Code Case N-883 removes size limit w/ requirements
- NRC concern: no jurisdiction without licensee as owner
- What is the safety issue here?
- Resolution needed to enable deployment



Courtesy of the [U.S. Department of Energy](https://www.energy.gov/)

Support for Risk-Informed, Performance-Based ASME III Division 5 Code Case N-940



- ASME, Section III, Div 5, CC N-940
“Alternative Rules for Construction of Class A Components for High Temperature Reactors Section” uses a risk-informed approach
- NRC limitations on this CC limit its benefit & increase cost with no safety benefit

Acceptance of UT in Lieu of RT for Construction and Pre-Service Inspections

- Sec. III requires RT for construction inspection (CI)
- Pre-service inspection requires UT
- CC permit UT vs. RT for CI
- UT is just as effective as RT but easier & no dose
- Sec. III criteria different than Sec. XI – unnecessary repair can sensitize for SCC
- CC improves safety & efficiency

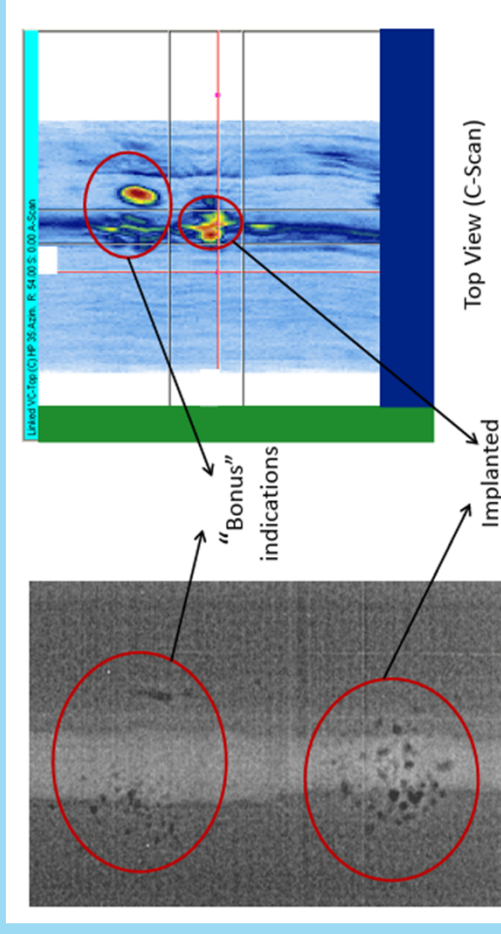


Image from NRC.gov - [ML13162A146](https://www.nrc.gov/ml13162A146)

Efficient and Effective Civil/Structural Codes for Advanced Reactors

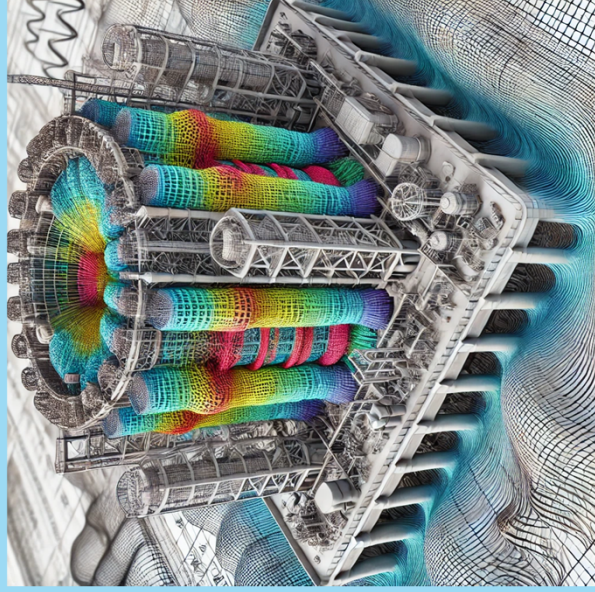


Image created using Dall_E

- High-quality and high-reliability options among non-nuclear Civil/Structural codes are
 - Risk-informed
 - Performance-based,
 - High reliability for many critical buildings in high seismicity areas
- Enhanced safety of advanced reactor designs, should permit flexibility

Codes and Standards for Advanced Reactors



- C&Ss that are risk-informed and leverage technological advancements
- Key priorities include
 - ASME III Code Case N-883 component manufacturing components prior to specifying the owner/licensee
 - ASME III Division 5 Code Case N-940
 - UT in lieu of RT for initial construction inspection & pre-service inspection
 - Civil/structural codes that recognize modern civil structural quality & enhance safety of advanced reactors

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