framatome

Neutron Flux / Fluence and Related Analyses

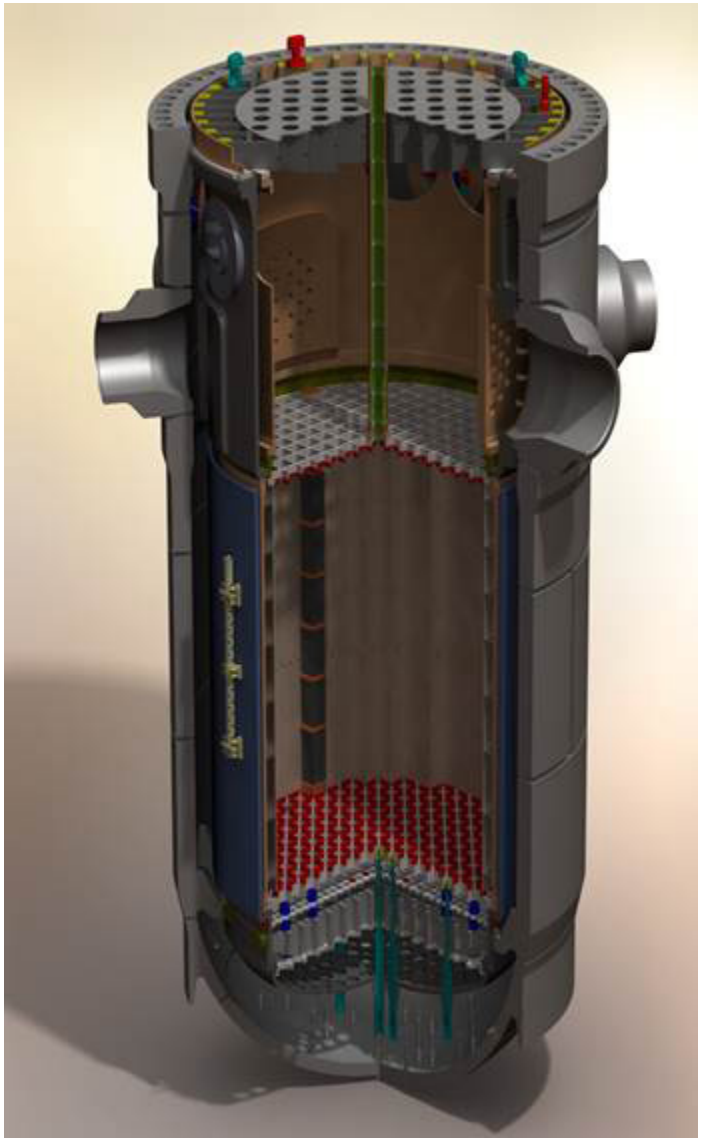
Expertise in required fluence monitoring program [especially for Subsequent License Renewals (SLR)] and direct support of Reactor Vessel Integrity and Reactor Vessel Internals Functionality analyses and determinations

Reactor Vessel Integrity & Internals Functionality

Framatome's Fluence and Radiation Analysis (FRA) professionals have extensive experience in monitoring neutron flux, from reactions inside reactor vessels, for both Pressurized Water Reactor (PWR) and Boiling Water Reactor (BWR) designs. Framatome has been an industry leader in fluence monitoring, both in calculation for a given cycle(s), comparison to measured values for uncertainty determination, and projection to end-of-life (EOL). Framatome's fluence methodology has been approved by the NRC for B&W, Westinghouse, Combustion Engineering, and General Electric designed reactors.

Framatome is a lead contributor in current industry efforts for refined fluence determination, measurement and appropriate uncertainty qualification of reactor vessel fluence both inside RV beltline and in locations adjacent to it, such as nozzles and transitions above and below the effective height of the active core.

The same NRC-approved method can be used to calculate the cumulative fluence, neutron flux integrated over time, that RV internals will be exposed to over the life of a reactor.

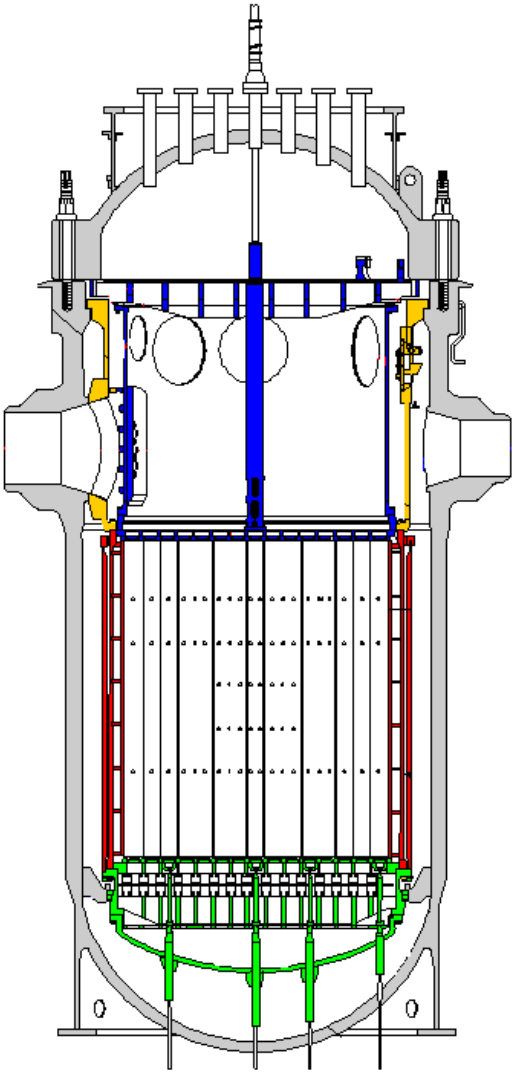


Embrittlement & Pressure Temperature Limits

Both reactor vessels and reactor vessel internals are susceptible to neutron (irradiation) embrittlement over time and a resulting degradation of material properties. As such, cumulative neutron fluence values are a leading indicator and key to demonstration of material integrity and functionality over the planned operating life or extended operating life of a plant.

Your performance
is **our** everyday **commitment**

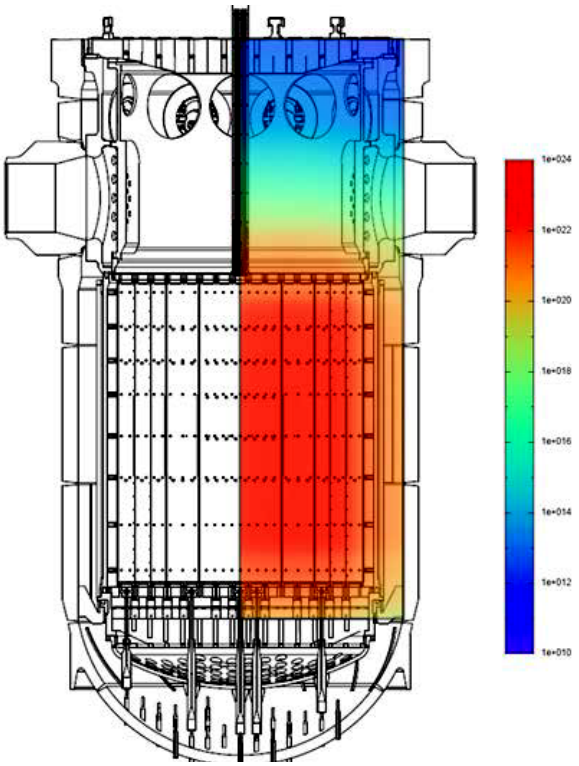
Any reactor vessel component that is expected to be exposed to cumulative neutron fluence ≥ $1x10^{17}$ n/cm^2 (1E+17) over the life or extended life of the plant must be considered, particularly for subsequent license renewals, as to whether the material may become limiting with respect to embrittlement or to pressure-temperature (P-T) and low-temperature overpressure protection (LTOP) limits per Regulation and ASME Code direction.



Reactor Vessel & Internals

Benefits

- NRC-approved and accepted calculation and measurement method (BAW-2241P-A)
- Extensive database supporting uncertainty of the calculated values
- Applicability to B&W, Westinghouse, and Combustion Engineering PWR reactor designs
- Applicability to GE BWR reactor designs
- Synergies with other disciplines both domestic and international
- Reactor Vessel Surveillance Capsule and program updates
- Cavity Dosimetry Exchanges and periodic fluence analysis updates
- Source Range Detector (SRD) analysis, decay heat analysis, radiation analysis capabilities
- Industry recognized subject-matter expertise



Reactor Vessel Fluence Mapping

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