

# BWR Fuel Engineering Services

A comprehensive resource for BWR operators

Framatome has supported the BWR market both as an OEM for German BWRs and as a reload fuel supplier for over 50 years to BWRs in nine countries. Continuous investment in fuel engineering technology provides a full suite of industry-best, NRC-approved methodologies for BWR support.

## Challenge

Nuclear industry plan asset managers face continual pressure to meet obligations to maximize shareholder value from their BWR. Managers need to understand the impact of equipment aging and modifications on fuel cycle operations. This demands the capability to accurately model the BWR system and fuel response to anticipated operational events and accidents. It also requires precision modeling of the reactivity characteristics of the fuel as it is depleted to assure maximum energy extraction from uranium purchases.

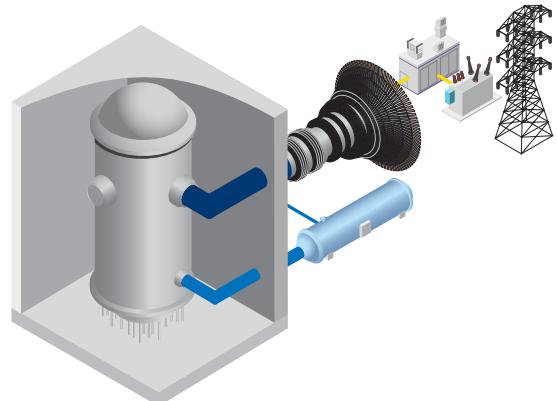
Utilities are also facing emerging challenges from evolving regulatory requirements. This demands advanced system models with sufficient detail to isolate the impact of new licensing criteria and understand how it will affect cycle design and operations. It also requires a fuel partner that works in a transparent and timely manner. Operators need solutions that do not limit control and knowledge of their plant assets.

## Solution

Framatome has developed a full suite of modern BWR fuel engineering capabilities that allow full independence from the OEM for all fuel-related cycle design and licensing scope. These tools also provide capability to perform exploratory analyses to determine the impact of proposed equipment replacements, changes in equipment surveillance and maintenance plans, and evolving equipment-out-of-service conditions.

Framatome also brings the experienced engineering staff to understand your issues and how best to efficiently and accurately address your engineering needs.

Framatome's open and long-term relationships are echoed in the approach to structuring engineering services, including extensive flexibility for operators to self-perform a number of tasks with either Framatome or third party methodology.



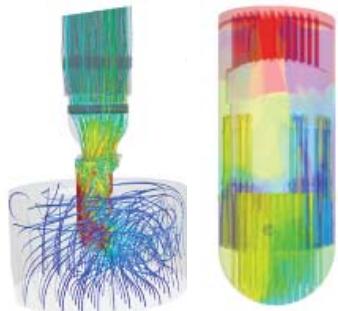
Framatome can analyze virtually all fuel-related aspects of your BWR

## Customer benefits

- Competitive procurement for all your fuel-related analytical needs
- Transparency in the performance of engineering services
- Flexible solutions from full to shared scope cycle engineering
- Freedom from OEM "black box" solutions limiting operator control
- Framatome Installed Base support to go beyond fuel-related scope
- Accurate core simulator modeling for reactivity management
- Comprehensive system modeling for assessment of emerging issues
- Experienced staff knowledgeable in USNRC and ASME compliance
- Extensive fuel mechanical and hydraulic test capabilities

**Your performance  
is our everyday commitment**

Framatome maintains a full suite of NRC-approved methods for BWR fuel cycle design and licensing and extended capabilities for Computational Fluid Dynamics and GOTHIC analyses



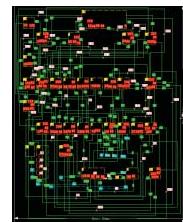
Component and system modeling with computational fluid dynamics



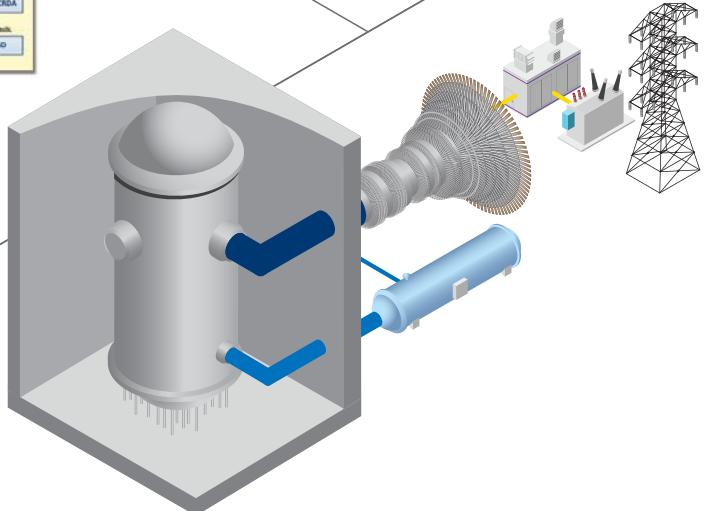
Full and shared scope cycle design and licensing



Comprehensive mechanical and hydraulic testing



Containment and system modeling with GOTHIC



## Operator/Framatome Scope

- Reload and cycle nuclear design
- Core monitoring system update
- Core follow

## Typical Framatome Scope

- Cycle AOO and LOCA analysis
- Cycle reactivity excursion analysis



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