

Improving Nuclear Fuel Reliability:

MODULE NO. 1 *NUCLEAR FUEL DESIGN REVIEW*

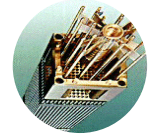
Nuclear fuel designs are continually evolving. Not only are new designs and design features routinely offered by fuel vendors, but the design of existing fuel assemblies is often modified to address performance problems or to enhance performance. It is incumbent on reactor operators to ensure, to the extent possible, that the vendor has adequately addressed all potential failure mechanisms, conducted an appropriate testing program, etc. This can best be accomplished in a formal independent design review prior to accepting a design change or committing to a new fuel design.

A comprehensive design review is the first crucial step in achieving top decile fuel performance.

This module addresses the importance of design reviews, when they are appropriate and the procedures and activities that comprise utility design review programs. Its objective is to assist the utility in developing and executing an effective, efficient design review.

The objectives of the standard Design Review Module are as follows, but the training sessions may be customized to meet your specific needs. This module can be conducted in less than one day.

- ◆ Describe and Discuss the Importance of Design Reviews
 - Precluding fuel failures and other problems
 - Design and operating uncertainties
 - Identification of potential problems at the earliest stage
- ◆ Present and Discuss Examples from NAC Stoller's Experience of How Design Reviews Have Helped Ensure Fuel Reliability
 - Inputs to vendor approach to design changes to resolve a specific problem
 - Identification of incompatibilities with residual fuel and plant equipment
 - Identification of pressure drop incompatibility with residual fuel design
 - Identification of incompatibility of new design with existing refueling machine
 - Identification of incompatibility of new fuel design with existing storage racks
- ◆ Describe and Discuss the Applicability of Design Reviews
 - Fuel from new supplier
 - Design change from current supplier
- ◆ Describe and Discuss Scheduling of Design Reviews
 - Prior to purchase
 - During bid evaluation
 - Following design change to resolve specific problem(s)
 - Subsequent to purchase



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- ◆ Describe and Discuss the Elements of Design Review Programs
 - Review and assessment of vendor's design documentation
 - Review of the adequacy of the vendor's test programs and its results
 - Meetings with the vendor and identification of open issues
 - Resolution of open issues
 - Schedules for design reviews
- ◆ Describe and Discuss Design Reviews for Design Changes to Resolve Specific Problems
- ◆ Describe and Discuss the Disciplines Addressed and Critical Areas of Concern
 - Nuclear design review
 - T/H and safety design review
 - Mechanical design review, drawings and specifications
 - Fuel assembly materials
- ◆ Describe and Discuss Design QA Audits
 - Objectives of design audits
 - Guidance for 'spot' technical audits
 - Nuclear
 - T/H
 - Mechanical