



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

May 3, 2002

Ms. Lynnette Hendricks  
Director, Licensing  
Nuclear Generation  
Nuclear Energy Institute  
1776 I Street, NW  
Suite 400  
Washington, DC 20006-3708

SUBJECT: REVIEW OF NUCLEAR ENERGY INSTITUTE FUEL  
CLASSIFICATION PROTOCOL FOR DRY FUEL STORAGE

Dear Ms. Hendricks:

By letter dated October 3, 2001, you requested review of a document titled, "Fuel Classification Protocol for Dry Fuel Storage." You stated that the protocol was written in support of Interim Staff Guidance 1 (ISG-1), "Damaged Fuel."

We are currently in the process of revising ISG-1 to provide more comprehensive guidance related to spent fuel classification. Additionally, the Spent Fuel Project Office staff are participating in the ANSI subcommittee tasked with completing an ANSI N14.33 standard for the classification of spent fuel. That standard is currently in draft form, and is not expected to be completed until late next year. We understand the need to provide more comprehensive guidance in ISG-1 in a timely manner. With that in mind, we have performed a technical review of your protocol document. The staff has found a number of useful items from your draft protocol and is actively now considering how to best incorporate those into a revised ISG-1. For your information, we have provided the attached staff comments regarding the protocol you submitted. Broadly, we find your protocol document somewhat parallel with the draft ANSI N14.33 standard.

However, to ensure consistent guidance is provided on spent fuel classification, we have determined that a staff revision to ISG-1 is more appropriate at this time, in lieu of an endorsement of your protocol document. As such, we have closed the review of your submittal. We plan to have a revision to ISG-1 completed by November 2002. In completing this revision, we will consider carefully both the guidance in the protocol document you submitted, and the draft guidance in the ANSI N14.33 standard.

L. Hendricks

-2-

Should you have any comments or concerns related to the attached technical review comments, please inform me or Geoffrey Hornseth of my staff at 301-415-8500, so that the appropriate technical reviewers may be made available for a discussion.

Sincerely,

*/RA/*

E. William Brach, Director  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
and Safeguards

Enclosure: NRC Staff comments

May 3, 2002

L. Hendricks

-2-

Should you have any comments or concerns related to the attached technical review comments, please inform me or Geoffrey Hornseth of my staff at 301-415-8500, so that the appropriate technical reviewers may be made available for a discussion.

Sincerely,

*(Original Signed by:)*

E. William Brach, Director  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
and Safeguards

Enclosure: NRC Staff comments

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## Enclosure

### NRC Staff comments regarding proposed NEI damaged fuel protocol

It is noted that the proposed protocol is silent with respect to ISG-11 (high burn-up fuel). It is understood, or should be stated, that any further considerations relating to high burn-up fuel would be in addition to the requirements of the proposed protocol.

The major concern with the protocol is in the initial steps of the flow chart. An assembly is "suspect" if no operational or inspection records exist to show it is not "failed" (with either pinhole leaks/hairline cracks or more substantial damage), or if records indicate it is failed, but the level of failure is unknown. Suspect assemblies must undergo further testing/inspection to determine the level of failure. This further testing may include ultrasonic or eddy current testing, visual examination or sipping. It should be left to the licensee to determine and document appropriate justification for the method used for each specific situation.

Conversely, if the fuel is classified as "damaged" by records (as opposed to "suspect") it should not be possible to re-classify it as undamaged based upon a visual examination. A visual examination may not detect certain types of interior damage that were detected by a previous inspection (for example, post-operational sipping). Once a fuel assembly is classified as damaged by an appropriate testing method, either in the past or in preparation for cask loading, subsequent tests should not be allowed to be used to re-classify that assembly as intact. Once classified as damaged, the logic path should default to the canning or alternative analysis stages.

As an additional point of clarification, the visual inspection procedure must include both an external inspection and the internal inspection using backlighting. The two together must constitute the visual inspection.

If existing plant operational and/or inspection records are used as the sole method of classification of the fuel (i.e., if no new inspections are performed prior to cask loading), then licensees should be required to also maintain records verifying no adverse fuel handling events or pool conditions occurred during the pool storage period which could have potentially jeopardized the fuel classification. Should such events have occurred, then further inspections should be required to be performed to properly classify the fuel. Licensees should assume events could have occurred if they are unable to demonstrate their problem reporting system should have identified past fuel handling events, or if historical pool chemistry records are not complete.

The staff agrees that an alternative to any staff position, Code, etc., may be proposed. Allowance for proposed alternatives is within the bounds of the regulatory framework and is available to any party that chooses to pursue an alternative. However, such analyses would require prior staff approval unless a staff approved methodology has been identified and applied.

As an additional point of clarification, any proposed alternative to canning of damaged fuel must include a structural analysis of the cladding/bundle for normal and off-normal events in storage

to satisfy retrievability requirements. However, thermal, shielding, and criticality analyses are required under all conditions (normal, off-normal, and accident) for both storage and transport. Therefore, for hypothetical accident conditions of transport, and for accident conditions of storage, these safety analyses must assume appropriate bounding conditions for the configuration of any damaged fuel rods.