



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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MFN-087-~~84~~-L. GRIDLEY.

Mr. R. L. Gridley, Fuel and Services
Licensing Manager
Nuclear Safety & Licensing Operation
General Electric Company
175 Curtner Avenue
San Jose, California 95125

Dear Mr. Gridley:

Subject: Acceptance of GE Proposed Fuel Surveillance Program

- References:
- (1) J. S. Charnley (GE) to C. H. Berlinger, (NRC), "Post-Irradiation Fuel Surveillance Program", November 23, 1983.
 - (2) L. S. Rubenstein (NRC) to R. L. Gridley (GE), "Post-Irradiation Fuel Surveillance", January 18, 1984.
 - (3) J. S. Charnley (GE) to L. S. Rubenstein (NRC), "Fuel Surveillance Program", February 29, 1984.
 - (4) J. S. Charnley (GE) to L. S. Rubenstein (NRC), "Additional Details Regarding Fuel Surveillance Program", May 25, 1984.

Reference 1 contained a GE proposal for a program to satisfy the requirement for a post-irradiation surveillance program described in Section 4.2.II.D.3 of the Standard Review Plan. While the Standard Review Plan addresses guidelines and requirements for license applicants, we understand that GE proposes to accept the responsibility for post-irradiation surveillance of GE designed and manufactured fuel assemblies. This program would then be referencable by applicants proposing to use GE fuel as demonstrating satisfactory compliance with Section 4.2.II.D.3 of the Standard Review Plan.

In Reference 2 we agreed to your proposal in principle but requested clarification of several points. Continuing discussion and clarifications are reflected in References 3 and 4. As a result of these clarifications we now find the GE proposal acceptable for post-irradiation fuel surveillance. It is our understanding that this program consists of the following.

1. For new fuel designs, GE will conduct a general visual examination of the exterior surfaces of a statistically meaningful number of fuel bundles upon discharge. The examination will be conducted as described in the Attachment to Reference 1.

This examination will be conducted at two applications of the new design from the first year in which the design is introduced, as described in Reference 4.

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2. Lead Test Assemblies (LTAs) of new fuel designs will be utilized to test new fuel features. These LTAs will be precharacterized and inspected after irradiation using the non-destructive testing techniques described in the Attachment to Reference 1.
3. GE's current fuel surveillance program for standard fuel designs will be continued at its present level of effort and the results of this program will be reported to the NRC in a yearly operating experience report.

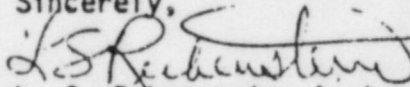
As discussed with you earlier, we view this program as satisfying the Standard Review Plan requirement for routine post-irradiation surveillance. If a problem were to arise with GE designed fuel for which increased surveillance would be useful, surveillance in addition to that contained in this program may be required.

In addition, this program in no way lessens our intent that licensees maintain an effective on-line surveillance effort as described in Section 4.2.II.D.2 of the Standard Review Plan.

This program will apply only to GE designed and manufactured fuel and will not necessarily change any commitments made by a licensee with respect to fuel manufactured by other vendors which may be in the licensee's reactor.

Our basis for acceptance of your proposed program for post-irradiation fuel surveillance is twofold. First, we share your concern with attempting to assure adequate verification of safe fuel performance while still maintaining efficient use of industry resources. We believe the program, as described above, does this. In addition, the industry's fuel surveillance programs have, in the past, been responsible for the discovery of the major fuels related problems without initial NRC involvement. The test of this program will be the extent to which GE continues to discover any new anomalies in a timely and effective way.

Sincerely,



L. S. Rubenstein, Assistant Director
for Core and Plant Systems
Division of Systems Integration
Office of Nuclear Reactor Regulation

ATTACHMENT

General Electric Fuel Performance Verification Program

The General Electric fuel performance verification program consists of inspection of lead test assemblies (LTA's) for new designs, and offgas monitoring of all designs throughout their lifetime.

For new fuel designs, GE will, in addition, agree to conduct a general visual examination of the exterior surfaces of a statistically significant number of fuel bundles (12 bundles) upon discharge from each of two early commercial applications of the new product. The visual examination will be made using binoculars, borescope, periscope, or TV and will be sufficient to meet the objectives presented in SRP 4.2 for visual inspections. The schedule and scope of LTA inspections is contingent on both the availability of the fuel as influenced by plant operation and the expected value of the information to be obtained.

General Electric's LTA's are selectively inspected using one or more of the following techniques:

- 1) Leak detection tests, such as sipping.
- 2) Visual inspection with various aids such as binoculars, borescope, or periscope, with a photographic record of observations as appropriate.
- 3) Nondestructive testing of selected fuel rods by ultrasonic and eddy current test techniques.
- 4) Dimensional measurements of selected fuel rods.

Unexpected conditions or abnormalities which may arise are analyzed, and examination of selected fuel rods in hot cell facilities may be undertaken when the expected value of the information to be obtained warrants this type of examination. Results of this surveillance program will be updated annually by a GE proprietary letter report.

The use of LTA's provides early verification of performance targets as well as early indication of potential performance anomalies.

Specific plant fuel failures are accurately detected by offgas surveillance. Offgas surveillance is performed for all operating plants, and leak detection tests such as sipping are performed by the utilities at the end of each cycle, if warranted (based on analysis of the offgas surveillance results). Offgas surveillance is a very sensitive measure of fuel performance, and General Electric fuel failure statistics include fuel failures estimated as a result of offgas measurements. These fuel failure statistics will be updated in the annual letter report.

- If many fuel failures are detected, an analysis or investigation is initiated to determine the cause of the failures. In addition to review of operational parameters such as power history and water chemistry and of GE's current overall fuel experience base, the investigation may include site examinations, and when appropriate, searches of manufacturing records, tests of manufactured spare rods if available, and hot cell examination of selected irradiated fuel rods.