

October 14, 2003

MEMORANDUM TO: Stephen Dembek, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

FROM: Alan Wang, Project Manager, Section 2 **/RA/**
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF MEETING HELD ON AUGUST 26, 2003, WITH
GE NUCLEAR ENERGY (GENE) REGARDING EXTENDED POWER
UPDATES

On August 26, 2003, representatives of GENE met with the NRC staff to discuss a staff letter to GENE dated June 25, 2003, regarding the extended power uprate process. GENE was represented by Mr. George Stramback and Margaret Harding of Global Nuclear Fuels (GNF). Mr. Stramback noted that he wanted to make sure that when the staff referred to mixed cores, they meant fuel from different vendors, not different lines of GENE fuel. The staff agreed that was its intent. Mr. Stramback stated the reference core is the baseline of the core to be operated. Future cores must be able to demonstrate that reloaded core is within the bounds of the initial reference core.

Mr. Stramback noted that his understanding is that the staff goal for approval of an amendment is one year from the date of the last supplement. He inquired could the staff complete its review based on analyses performed and submitted one year before the outage that was "close" to the final analyses. The final analyses need to be based on the latest core operating history and that would be submitted six months prior to the outage. The staff stated it could do the review if GENE could state the analyses are bounding. GENE stated it could not make such a statement in all cases. The staff stated it could not approve an evaluation to justify operation at a higher power level before the licensee has demonstrated that the technical specifications bound the performance of the plant. The staff asked if GENE could provide a subset of the analyses that are bounded at 6 and 12 months. Ms. Harding stated that GENE would look at which analysis is not bounded to possibly limit the analyses that would be submitted six months prior to the outage. The staff asked why couldn't GENE make conservative assumptions that would bound the plant's current safety analyses. If some margin was lost, the licensee could request to "recapture" that margin after the final analyses were completed. The staff noted that the one year goal is an estimate on what the staff believes is a reasonable period to do the review. We may finish earlier, but we can only assure with some certainty our one year goal.

Representatives for Public Service Electric Gas (PSEG) noted that they would not consider reducing margin to expedite the review. The staff noted that its schedule for PSEG is not affected by these discussions and that these discussions are only in regard to future power

uprates. GENE agreed that these discussions are for future uprates, but noted that they feel there would be limited applications where a utility is uprating and using a different fuel vendor. They also noted that the staff was able to expedite certain previous reviews by the use of audits. The staff noted that the Dresden/Quad Cities audits were unusual as normally audits are used only for a confirmatory action. GENE inquired as to would having the "shells" of the final analyses help speed up the review. The shells would provide the staff with the methodology, but not the specific numbers. Again, the staff noted that that would be helpful, but to ensure a thorough review, the staff needs one year. GENE proposed a meeting to discuss the shells when these shells are completed in the next six to eight weeks.

GNF also discussed the misloaded fuel event which is treated as an operational transient in the GESTAR. A misloaded fuel event is either (1) misoriented fuel bundle event, or (2) mislocated fuel bundle. Misoriented fuel is 90, 180, or 270 degrees from the planned position. Mislocated fuel is two bundles placed in one another's planned position. GNF is considering changing the treatment of the misloaded event to that of a design-basis accident. By reclassifying this event, it would allow them to disposition the accident once in a licensing topical report (LTR), instead of each cycle during the core reload design. The staff has traditionally not been involved with dose calculations for these events, since they were dispositioned in the reload analysis as not leading to fuel failure. Section 15.4.7 of the Standard Review Plan assigns 10 percent of 10 CFR Part 100 as criterion for the dose analysis. GNF states that core verification discovers most occurrences and estimates the probability of this event to be less than $1E-6$. They assume that operation continues throughout the cycle, leading to a worst case:

1. not detected by (core) instrumentation,
2. fuel clad fails, maybe more than one,
3. detected by high off-gas activity,
4. an effort is made to identify that power is suppressed in vicinity of the leaker, and
5. if necessary, shut down the plant to remove the leaker, otherwise the plant would operate with suppressed power at the leaker location.

GNF stated they are considering two cases:

1. using a conservative assumption that all rods fail in the mispositioned bundle and the eight adjacent bundles
- or
2. backcalculate to determine how many rods may fail and still meet dose limit and then prove by thermo-hydraulics that that number of rods won't fail.

GNF will do analysis as a fuel line generic analysis, with assumptions intended to bound the most limiting plant. Each reload, an evaluation will be performed to assure that the input assumptions are still bounding. They will revise GESTAR to reflect the new analysis.

Steve La Vie, of the staff stated that the approach looks reasonable, but our approval can only be made once the staff has a chance to review the submittal. He noted that this wouldn't be

much different than the control rod drive assembly analysis. He suggested that GNF add General Design Criterion 19 to the acceptance criteria (GNF will need to do this for alternate source term (AST) and non-AST plants using Regulatory Guides 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors" and 1.195, "Methods and Assumptions for Evaluating Radiological Consequences of Design Basis Accidents at Light-Water Nuclear Power Reactors," as applicable).

Mr. La Vie suggested that they could have a problem identifying the limiting plant. He also suggested that some thought needs to be given to how this would be fitted in regulatory space. Typically, when the NRC approves a LTR, it only applies from that point on to those that want to use it. If the GESTAR was revised, how does each licensee's licensing basis get updated? Could GNF be doing reload analyses that are not directly reflecting that plant's licensing basis? In addition, 10 CFR 50.67 requires a license amendment request from each licensee for implementation of the AST. If that site does not already have approval for a FULL scope implementation of the AST, that licensee would have to continue with the non-AST analysis or request an amendment. He did not think our approval of the LTR could grant blanket approval under 10 CFR 50.67. This would have to be considered when the submittal is made.

The staff thanked GENE for its presentation. This meeting was informational. No regulatory decisions were made. GENE agreed to meet again in six to eight weeks. The meeting handout is located in ADAMS under Accession No. ML032691243. The attendance list is attached.

Project No. 710

Attachment: Meeting Attendees

cc w/att: See next page

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GE Nuclear Energy

Project No. 710

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MEETING ATTENDEES

MEETING WITH GE NUCLEAR ENERGY

EXTENDED POWER UPRATES WITH MIXED CORES

AUGUST 26, 2003

GE NUCLEAR ENERGY

G. Stramback
M. Harding (GNF)

OTHER

K. Hutko (PSEG)
D. Noigan (PSEG)
D. Raleigh (LIS Scientech)
L. Collins (Westinghouse)

NRC

L. Marsh
M. Johnson
J. Wermiel
F. Akstulewicz
S. Dembek
A. Wang
Z. Abdullahi
G. Thomas
E. Kendrick
M. Langschwager
H. Scott