October 17, 2007

MEMORANDUM TO: Stacey L. Rosenberg, Chief
Special Projects Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

FROM: Michelle C. Honcharik, Project Manager **/RA/**
Special Projects Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF JULY 25, 2007, CLOSED PRE-SUBMITTAL MEETING WITH GLOBAL NUCLEAR FUEL - AMERICAS, LLC (GNF), ON ZIRON AND ADDITIVE FUELS (TAC NO. MD6029)

On July 25, 2007, a closed pre-submittal meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of GNF at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The purpose of the meeting was to discuss GNF's work on planned topical reports (TRs) regarding Ziron and Additive Fuels. A list of attendees is enclosed.

The GNF representatives presented information on two planned TR submittals: the first regarding Ziron material for fuel rod and assembly components and the second regarding an approach for licensing additive UO_2 and $(U,Gd)O_2$ fuel. The GNF presentation slides are available in the Agencywide Documents Access and Management System (ADAMS) as accession number ML072740160.

During the Ziron presentation, the GNF representatives explained why Ziron materials are being developed, compared the GNF-Ziron composition to that of Zircaloy-2, reviewed the background of the GNF-Ziron research and development and usage, including lead use applications, and assessed the physical properties of GNF-Ziron. The GNF representatives also discussed GNF-Ziron's hydrogen uptake, tensile proprieties, tensile strength, creep behavior, corrosion, irradiation growth rates, and simulated loss-of-coolant accident test results. The GNF representatives discussed other tests still in progress, which will be completed prior to TR submittal. The GNF representatives also reviewed the outline for the planned TR.

The NRC staff provided the following feedback regarding the planned GNF-Ziron TR:

- When providing test data include the number of samples and spread of data.
- Explain test results from a metallurgical perspective, as opposed to just an observation.
- Address and explicitly justify why GNF is using specific data (i.e., mechanical properties) in its codes.
- If GNF requests approval to use Ziron in all components, then address Hydrogen pickup in each component.
- Include discussion of storage issues in the Methods and Licensing Assessment section of the TR.

- GNF should address and provide supporting documentation for the entire exposure range, not just high exposures.

During the Additive Fuels presentation, the GNF representatives presented the bases for applying an additive in BWR fuel and proposed an approach for licensing the additive fuel. The NRC staff provided the following feedback to the GNF representatives regarding the additive fuel TR:

- GNF should provide glass phase diagrams and an explanation of how they correlate to the crystalline phase diagrams; include the glass transition temperatures.
- GNF should perform a thermal cycling study and provide the differences in thermal expansion coefficients.
- GNF should discuss if/how its laser flash standards are calibrated for ceramics.
- Is the additive fuel a new fuel or a modification to an existing fuel?
- Would all additive fuels have the same weight percent or would there be multiple additive fuels?

Project No. 712

Enclosure: List of Attendees

cc w/encl: See next page

During the Additive Fuels presentation, the GNF representatives presented the bases for applying an additive in BWR fuel and proposed an approach for licensing the additive fuel. The NRC staff provided the following feedback to the GNF representatives regarding the additive fuel TR:

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Closed Pre-submittal Meeting with Global Nuclear Fuel - Americas, LLC (GNF)

July 25, 2007

Meeting Attendees

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Anthony Mendiola	NRC
Ralph Landry	NRC
Paul Clifford	NRC
John Voglewede	NRC
Jetsenia Toro Rojas	NRC
Richard Lee	NRC
Charles Harris	NRC
Kevin Ledford	GNF
Andy Lingenfelter	GNF
Charles Patterson	GNF
Mason Makovicka	GNF
Patrick Hogan	GNF
James Harrison	GNF
Yang-Pi Lin	GNF

ENCLOSURE