

October 25, 2005

MEMORANDUM TO: John N. Hannon, Chief  
Plant Systems Branch  
Division of Systems Safety and Analysis  
Office of Nuclear Reactor Regulation

FROM: Michele G. Evans, Chief **/RA/**  
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Division of Engineering Technology  
Office of Nuclear Regulatory Research

SUBJECT: FINAL TRANSMITTAL OF INFORMATION SUMMARIZING  
INTEGRATED CHEMICAL EFFECTS RESULTS AND  
IMPLICATIONS

The Integrated Chemical Effects Testing (ICET) program is being conducted under a joint memorandum of understanding between the NRC Office of Nuclear Regulatory Research (RES) and the Electric Power Research Institute (EPRI) to address concerns about the possible deleterious impact from chemical reaction products on emergency core cooling system (ECCS) performance during recirculation following a hypothetical Loss-of-Coolant Accident (LOCA). The primary objectives for the ICET series are to (1) determine, characterize, and quantify chemical reaction products that may develop in the containment pool under a representative post-LOCA environment; and (2) determine and quantify any amorphous or gelatinous material that could be produced during the post-LOCA recirculation phase.

The integrated chemical effects test (ICET) series was developed as a limited-scope suite of five different tests. Each test represents a unique containment pool environment that is intended to represent conditions applicable to a portion of the commercial Pressurized Water Reactor (PWR) plants. The background summary pertaining to the selection of test conditions and requirements for the ICET program is enclosed [Attachment 1]. Test condition and observation summaries are enclosed from the first five ICET runs [Attachments 2 - 6] to summarize the important test observations based on the analyses to date with respect to the ICET objectives above. These summaries are provided to support regulatory activities associated with GL2004-02. Additionally, a description of some possible implications to be considered when evaluating the GL2004-02 responses is enclosed [Attachment 7]. These implications were developed jointly with NRR staff in the Division of Engineering.

It is requested that these attachments be placed on the PWR Sump Performance website to inform the public about current findings related to the ongoing ICET program. These attachments should replace earlier versions that may currently exist on the website. Upon completion, separate data reports pertaining to each ICET test will be also transmitted.

These reports will provide more details concerning the test conditions and test observations, and will contain a more comprehensive study of any chemical by-products that form during these tests.

Attachments:

1. ICET Program Background
2. ICET Test #1: Test Conditions and Observations (NaOH and 100% Fibrous Insulation)
3. ICET Test #2: Test Conditions and Observations (TSP and 100% Fibrous Insulation)
4. ICET Test #3: Test Conditions and Observations (TSP and 80% Cal-Sil and 20% Fibrous Insulation)
5. ICET Test #4: Test Conditions and Observations (NaOH and 80% Cal-Sil and 20% Fibrous Insulation)
6. ICET Test #5: Test Conditions and Observations (Sodium Tetraborate and 100% Fibrous Insulation)
7. Implications of ICET Program Results

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7. Implications of ICET Program Results

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