

October 24, 2003

MEMORANDUM TO: Ledyard B. Marsh, Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

FROM: Scott Newberry, Director /RA/
Division of Risk Analysis and Applications
Office of Nuclear Regulatory Research

SUBJECT: TRANSMITTAL OF REPORT "MONITORING AND REPORTING
INDUSTRY PERFORMANCE FOR THE INITIATING EVENTS
CORNERSTONE OF SAFETY"

By this memorandum, I am sending you a copy of the final draft report entitled "Monitoring and Reporting Industry Performance for the Initiating Events Cornerstone of Safety." This work was performed in accordance with NRR User Need Memorandum NRR-02-023 and the associated task plan for this effort. This report documents our development efforts to date in support of the Industry Trends Program (ITP). This work has been closely coordinated and reviewed by cognizant NRR staff, primarily from Inspection Program Branch (IIPB).

In March 2003, we sent out the draft report, "Development of an Integrated Industry Initiating Events Indicator," for review and comment. Comments were received from several external reviewers. Your staff has informally shared NRR and regional comments with us. We officially received these review comments earlier this month. We have incorporated several of the suggestions made by the internal and external reviewers in this report. Since we just received the NRR and Region review comments earlier this month, we will follow our usual practice and evaluate each comment and document our response. When this is completed, we will send the comment resolution package to you.

We have also shared the concepts with the joint ACRS subcommittees on Operating Experience and PRA in May 2002, November 2002, and May 2003. In July 2003, we discussed them in a public workshop on the Industry Trends Program (ITP) and the baseline risk index for initiating events (BRIIE).

Following the existing structure and practices in the ITP, we have developed a two-tier approach for monitoring and evaluating risk-significant initiating event performance at the industry level. The Tier 1 activity includes trending 10 risk-significant initiating events for PWRs and nine for BWRs, and monitoring yearly industry performance against prediction limits. Yearly results for past years are also monitored for degrading trends that may be starting. These ITP Tier 1 activities have the potential to help the NRC identify degrading industry performance such that appropriate NRC actions can be taken. This is consistent with the agency strategic performance goals.

The Tier 2 activity integrates the individual initiating event performance into the BRIIE, evaluated separately for PWRs and BWRs. ITP Tier 2 activity involves monitoring the risk significance of changes in industry initiating event performance. Risk significance is evaluated in terms of the index, which is related to CDF or Δ CDF. It combines operating experience for risk-significant initiating events with associated internal event CDF-based importance information. A strength of the method is the ability to combine several initiating events with different risk importances with a single risk weighted trend. BWRs and PWRs have different core damage frequencies, which depend to some extent on different initiating events. The risk weights for various initiating events are also different for the two types of reactors. Therefore, the integrated index results are presented for each reactor type. The yearly BRIIE results can then be compared with thresholds.

To illustrate the use of predictive distributions and prediction limits for the assessment of individual initiating events, we use the August 14, 2003, grid event as an example. The results are presented in the report. While the research to date has developed a concept that appears to have value to our regulatory program, some technical, policy, and implementation tasks have been identified.

The key technical and policy issues that need to address are:

- Should the CDF or Δ CDF formulation of the BRIIE be used?
- What should be the threshold values for the BRIIE?
- What prediction limits should be used on individual initiating event trends?
- How should the BRIIE and individual initiating trends be presented to the public?

The main implementation tasks are the following:

- Conduct a pilot exercise to set thresholds based on the current example calculations. From this we can learn what is the best way to present information to a panel and what additional information would be helpful when setting the thresholds.
- Before BRIIE implementation, the initiating event frequencies and other failure probabilities should be updated in the SPAR models so that the Birnbaum importances are based on current performance information.
- Perform studies using the SPAR models to provide information about the robustness of the BRIIE. Compare with industry PRA models where possible.
- Develop procedures, process, and quality assurance guides for the Tier 1 and Tier 2 activities.

We look forward to working with you and your staff in the final development stages and in the implementation of this indicator. In particular, I am interested in your feedback so that we can adjust our plans and resources. If you have any questions, please contact me or Dr. Dale Rasmuson of my staff.

Attachment: As stated

cc w/att.:

J. Strosnider/A. Thadani, RES

J. Dyer, NRR

B. Sheron, NRR

R. Borchardt, NRR

J. Craig, NRR

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