

November 22, 1996

Mr. James M. Taylor
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Mr. Taylor:

SUBJECT: NRC PROGRAMS FOR RISK-BASED ANALYSIS OF REACTOR OPERATING
EXPERIENCE

During the 436th meeting of the Advisory Committee on Reactor Safeguards, November 7-9, 1996, we reviewed the NRC programs for risk-based analysis of reactor operating experience. We heard presentations by and held discussions with representatives of the NRC staff regarding programs of the Office for Analysis and Evaluation of Operational Data (AEOD) including system reliability studies, risk-based performance indicators (PIs), accident sequence precursor (ASP) studies, and common-cause failures (CCFs). In addition, our joint Subcommittees on Probabilistic Risk Assessment (PRA) and on Plant Operations met with representatives of the NRC staff and its contractors on July 17 and October 30, 1996, to review these matters. We also had the benefit of the documents referenced.

The AEOD staff presented a summary report of its programs for risk-based analysis of reactor operating experience. We found these programs to be comprehensive in covering the collection and analysis of operational safety data based on operating plant experience and balanced in providing results to both the immediate assessments for the NRC's plant PIs and the continuing longer range assembly of useful databases for system performance including CCF rates. We are convinced that careful review of operating experience is the most applicable source of information that the NRC and the industry have to validate system reliability analysis models and predictions, and is the best source of data for future use.

These databases have been developed through significant resource expenditures by the industry and the NRC. Both share the results of this effort through their independent analyses of event reports, system reliability data, etc. This information can be made useful only if the results are carefully reviewed for insights into system reliability, human performance, and utility and NRC management practices that may affect safety. The AEOD programs reflect an awareness of the need to analyze these data intensively; however, the resources to perform a full scope analysis are not currently available. We urge that the priority assigned to this effort be revisited.

The NRC and the Institute of Nuclear Power Operations (INPO) have worked very hard to negotiate a more extensive sharing of their individual analysis products. These efforts have had some success, namely, NRC has gained access to data in the Nuclear Plant Reliability Data System of INPO, thus expanding the bases for NRC compilation of CCF data. Some concerns remain with regard to the protection of INPO proprietary rights. We believe any database used by NRC on CCF should be accessible to the public.

The CCF database that has been developed is a significant technical step forward. AEOD uses the database for generic evaluations. Plant-specific evaluation will almost certainly require modification to reflect configuration differences between the specific plant being considered and AEOD's generic evaluations. Provision should be made to caution any users of the CCF database of the limited applicability in its current form and, if possible, provide guidance on the proper process for modifying the database to reflect specific plant characteristics.

The AEOD staff presented some information on planned revisions to the NRC's PIs and initial efforts to incorporate risk-based PIs into the program. We look forward to further examination of candidate indicators. They must be carefully selected with a clear understanding of how the connection to risk is made and how this connection can be quantified. A first step will be the definition of the characteristics and attributes of risk-based PIs.

The AEOD staff is making progressive incremental improvements in its computational tools. It does not, however, have a long-range vision of the tools and resources that should be available to support risk-informed and performance-based regulation. We recommend that such a long-range plan be formulated for the development of computational tools.

The AEOD staff plans to enhance the ASP program to provide a more useful experience base for evaluating PRA results. The study of reliability of specific systems is a most important adjunct to these studies. The planned addition to its study list of selected systems that are important to safety is timely. We welcome the opportunity to participate in this important work.

Sincerely,

/s/

T. S. Kress
Chairman

References:

1. Office for Analysis and Evaluation of Operational Data report, "Risk-Based Analysis of Reactor Operating Experience," dated December 15, 1995
2. Memorandum dated March 22, 1996, from C. E. Rossi, Office for Analysis and Evaluation of Operational Data, NRC, to Office of Nuclear Reactor Regulation Directors and Regional Directors, NRC, Subject: Special Report - Emergency Diesel Generator

- Power System Reliability 1987-1993, INEL-95-0035 (1 volume)
3. Memorandum dated December 22, 1995, from C. E. Rossi, Office for Analysis and Evaluation of Operational Data, NRC, to G. Holahan, NRR, D. Crutchfield, M. Hodges and L. Shao, Office of Nuclear Regulatory Research, NRC, Subject: Common Cause Failure Parameter Estimates for Selected Components, INEL-94-0064 (6 volumes)