

September 8, 2000

The Honorable Richard A. Meserve
Chairman
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Meserve:

SUBJECT: CAUSES AND SIGNIFICANCE OF DESIGN BASIS ISSUES AT U.S. NUCLEAR POWER PLANTS

During the 475th meeting of the Advisory Committee on Reactor Safeguards (ACRS), August 29 - September 1, 2000, we met with representatives of the Nuclear Regulatory Commission (NRC) staff to review their study of design basis issues (DBIs). The study describes trends and causes of DBIs. The ACRS had previously expressed concern that the disbanding of the Office of Analysis and Evaluation of Operational Data (AEOD) would make it difficult to retain the assessment of operational experience. Therefore, we are pleased to learn that analyses of data have been continued.

The staff examined Licensee Event Reports (LERs) to determine the level of risk of the finding, whether safety system intervention occurred, whether an actual or a potential event took place, and the consequences of the event described in the LER (failed or degraded system or train). From 1985 through 1997, the leading causes of DBIs were original design errors - 72%, procedure deficiencies - 28%, and human errors - 22% (note that more than one cause has generally contributed to each DBI).

Emergency core cooling, emergency ac/dc power, and containment and containment isolation were the safety related systems that accounted for about half of the DBIs. About 19% were potentially risk significant. Although the number of DBIs increased substantially due in part to increased scrutiny, the fraction of DBI events that qualified as accident sequence precursor events decreased from approximately 8% in 1990 to less than 1% in 1997.

The lessons learned from the data analysis support our contention that it is important not to lose the capability that resided with the former AEOD. This particular compilation of data on operational experience should have an impact on how probabilistic risk assessments (PRAs) are reviewed. The results imply that the risk contribution of design faults revealed by operational experience is limited.

The small fraction of risk significant events suggests that the criteria for what constitutes DBI LERs should be redefined. This would reduce the burden of reporting requirements with no impact on safety.

Sincerely,

/RA/

Dana A. Powers
Chairman

Reference:

U. S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research Draft Report, "Causes and Significance of Design Basis Issues at U. S. Nuclear Power Plants," May 2000.