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POLICY ISSUE

SECY-90-326

For: The Commissioners (Information)

From: James M. Taylor
Executive Director for Operations

Subject: QUARTERLY REPORT ON EMERGING TECHNICAL CONCERNS

Purpose: To inform the Commission of newly emerging technical concerns and proposed approaches for their resolution.

Background: In the November 13, 1989, staff requirements memorandum (SRM 891025), the Commission asked the staff to keep it abreast of new issues on a quarterly basis, and to propose approaches for resolving these issues. The Commission also asked the staff to work closely with industry for timely resolution of each technical issue.

Summary: This quarterly report identifies issues which the NRR staff views as emerging technical concerns. The paper also characterizes current staff efforts to resolve these issues.

Discussion: The staff has identified the following technical concerns which it feels should be brought to the attention of the Commission:

1. Availability of Equipment While a Plant is in a Shutdown Condition

This technical concern was discussed in SECY-90-199, dated June 4, 1990. The following contains new information which should be brought to the attention of the Commission.

In discussions with foreign regulatory organizations (i.e., French and Swedish) about their shutdown risk evaluations, the NRC staff has learned that the contribution of shutdown risk to core damage frequency is a fairly substantial fraction of the total core damage frequency. The NRC staff has now developed a plan for the evaluation of shutdown risk and development of recommendations for risk management, which is summarized below.

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The NRC staff has planned a study in which precursors to core damage during shutdown will be identified from operating experience and evaluated for their contributions to risk. The review of operating experience will include the analysis of licensee event reports (LERs), the evaluation of foreign experience and shutdown risk evaluations, and nuclear power plant visits. Important technical issues to be examined include the following: (1) the potential for the loss of subcriticality, (2) the acceptability of alternate means and procedures for decay heat removal, (3) the implications of reduced containment integrity during shutdown, (4) the implications of reduced equipment availability during shutdown, and (5) the frequency of initiating events caused by abnormal outage activities. This study will form the basis for (1) proposed changes to current technical specifications that govern shutdown operations, (2) recommendations to the industry regarding emergency response procedures and outage management and control, and (3) modifications to the NRC inspection program. NRR will lead the study, with support from RES, AEOD, and the regional offices. A steering committee has been established which includes senior NRC managers from NRR, RES, AEOD, and Region IV. On July 12, 1990, the staff briefed the ACRS on this project. NRR plans to complete this study by December 1991.

2. Generic Issue 23 Resolution

The Office of Research has completed its study of Generic Issue 23, "Reactor Coolant Pump Seal Failures." The study concludes that when all seal cooling is lost, seal integrity becomes questionable and significant leakage from pump seals could result if seal cooling is lost for a prolonged period. However, it is difficult to estimate the probability and magnitude of such leakage. There are two dominant modes for loss of seal cooling: (1) extended loss of all AC power (station blackout) and (2) failures that disable either the service water or component cooling water system for an extended period. The Generic Issue 23 proposed resolution package is currently undergoing internal review and review by the ACRS.

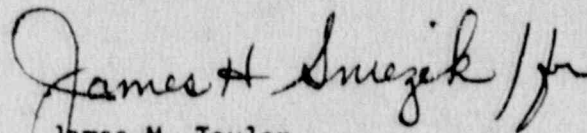
For PWRs the proposed resolution includes three elements, with the key element being a recommendation that each plant provide the capability to cool the reactor coolant pump (RCP) seals during off-normal plant conditions such as station blackout (SBO).

The research findings, in their present form, are significant relative to implementation of the SBO rule for PWRs. During SBO rule development it was recognized that a critical input assumption for coping analysis is the leakage rate which could result from failed RCP seals. The staff and industry agreed that, pending resolution of Generic Issue 23, a value of 25 gallons per minute for PWRs and 18 gallons per minute for BWRs would be used. Based on the current findings of Generic Issue 23 regarding the inability to rule out significant leakage during a station blackout event, the coping analysis, if performed to satisfy the SBO rule, is likely to be flawed unless the recommendation to upgrade seal cooling capability is implemented or some other suitable alternative is provided.

For BWRs the study concluded that all but four plants have sufficiently large, AC power-independent, makeup capabilities (HPCI and/or RCIC systems) that the incremental risk from a seal failure LOCA or station blackout is insignificant. Additional information on the remaining four BWRs is needed before a final determination can be reached on these plants.

The staff intends to inform the industry of the potential impact of this issue on station blackout evaluation after completion of the ACRS and the CRGR reviews.

Our next update on emerging technical concerns will be sent to the Commission in December 1990.



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