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MEMORANDUM FOR: Harold R. Denton, Director
Office of Nuclear Reactor Regulation

FROM: C. J. Heltemes, Jr., Director
Office for Analysis and Evaluation
of Operational Data

SUBJECT: CASE STUDY REPORT -- OVERPRESSURIZATION OF EMERGENCY
CORE COOLING SYSTEMS IN BOILING WATER REACTORS

The Office for Analysis and Evaluation of Operational Data has finalized its case study of operating events involving an actual or potential overpressurization of a BWR emergency core cooling system. The final report addresses the peer review comments provided by NRR, IE, the Regions, NSAC and INPO on our preliminary report, and contains several specific recommendations aimed at addressing the root causes of the reported failures. We have enclosed a copy of our final report for your information and appropriate action.

In each of the eight events studied, one or both of the valves, which isolate the high pressure reactor coolant or feedwater system from the low pressure piping of an emergency core cooling system, was seriously degraded. In all of the events a testable isolation check valve failed to be fully closed when required. Five of the events also involved a simultaneous inadvertent opening of a normally closed motor-operated pressure isolation/injection valve. Four of these five events occurred with the plant operating at power, thereby resulting in an actual overpressurization of the unprotected emergency core cooling system.

It is AEOD's view that these operating experiences, when taken together, represent a trend with potentially serious safety implications. Our analysis indicates that the likelihood of an interfacing loss-of-coolant accident between the reactor coolant system and an emergency core cooling system is significantly greater than had been previously assessed. Such an accident would involve the discharge of high energy reactor coolant outside primary containment which would also likely disable one or more of the safety systems required to mitigate the accident. Although none of the operating events has yet resulted in an actual pipe failure, our assessment concludes that generic corrective measures are needed to prevent recurrences involving potentially more serious consequences.

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We are aware that since our preliminary report was issued, NRR has identified interfacing loss-of-coolant accidents at BWRs as Generic Issue No. 105 and has given it a high priority ranking. AEOD fully supports the high priority ranking established for this issue. However, we are concerned that the frequency of the recent events may indicate that a recurrence could occur at an operating BWR plant at some time during the next few years. We therefore believe that the actions to be taken to resolve Generic Issue No. 105 should be expeditiously pursued in order to quickly reestablish the safety margins originally intended to prevent interfacing LOCAs in BWRs. Additionally, we would urge NRR to give prompt consideration to early implementation of one or more low cost and relatively effective corrective actions such as those presented in the enclosed case study report (e.g., recommendations 1, 2, and/or 3).

If you or your staff have any questions regarding the enclosed report, please contact Peter Lam of my staff. Dr. Lam can be reached at 492-4438.

Original Signed by
C. J. Heltemes, Jr.

C. J. Heltemes, Jr., Director
Office for Analysis and Evaluation
of Operational Data

Enclosure:
As stated

cc w/enclosure
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