

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SEP 7 1979

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R. Mattson
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MEMORANDUM FOR: R. F. Fraley, Executive Director
FROM: Harold R. Denton, Director, Office of Nuclear
Reactor Regulation
SUBJECT: REQUIREMENTS FOR SHUTDOWN AND DECAY HEAT
REMOVAL USING SAFETY GRADE EQUIPMENT

50-320

Your memorandum of March 14, 1979 to Mr. Gossick transmitted a recommendation of the ACRS that the staff undertake a limited probability study to provide insight into the merits of various arguments concerning the staff's position on shutdown and decay heat removal. These arguments concerned the relative safety merits of hot-standby versus cold-shutdown conditions, the maximum desirable time interval before decay heat removal could be accomplished by the low pressure residual heat removal system, and the need for safety related equipment to make the transition from hot standby to cold shutdown.

The NRC staff position on shutdown and decay heat removal, presented to the Committee on February 9, 1979, was based on the consideration that closed-loop long-term cooling of the reactor at low pressure and temperature conditions associated with operation of the Residual Heat Removal (RHR) system is preferred to continue decay heat removal at elevated pressures and temperatures. This position was meant to address situations/scenarios where there was extensive equipment failure and/or loss of offsite power, which would require going to cold shutdown for inspection or repairs, but did not address a situation involving extensive core damage such as occurred at Three Mile Island.

The subject of the role and appropriate design requirements of the RHR system is included in the scope of the current study of lessons learned from TMI-2, as is the subject of reliance on non-safety related equipment. At TMI-2, the RHR system was not placed in operation early in the event because of the inability to depressurize the reactor coolant system to the RHR initiation pressure. Use of the RHR system was not initiated at a later time because of the high levels of contamination in the reactor coolant system and concern regarding the leak-tightness of the RHR system outside

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of containment. Implementation of two of the short-term recommendations of the Lessons Learned Task Force which concern the integrity of systems outside containment and the design review of plant shielding for post-accident operation will improve the capability for operation of present RHR systems in the event of high levels of contamination in the primary coolant system.

We believe that further probabilistic studies of the shutdown and heat removal systems, such as the Committee recommended will be more meaningful if conducted in the broader context of our study of the role and appropriate design requirements of RHR system; in light of lessons learned from TMI-2. As we progress with this longer-term effort, we will involve the Probabilistic Assessment Staff in the planning and conduct of the study.

Pending the outcome of the long-term recommendations of the Lessons Learned Task Force, the staff will continue to take the position in licensing actions that the design be such that the plant could be taken from power operation to cold shutdown on the RHR using safety related equipment. This position would impose requirements on the equipment design and fabrication for new plants that is consistent with our present basis for considering other equipment that is important to safety. Without these requirements, such equipment would not have defined quality standards, and in large part, would not be reviewed by the staff.

As the study of long-term lessons learned progresses, we will keep the Committee informed of the impact on our position with regard to the RHR systems.

Original signed by
E. G. Case
Harold R. Denton, Director
Office of Nuclear Reactor Regulation

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Pending the outcome of the long-term recommendations of the Lessons Learned Task Force, the staff will continue to take the position in licensing actions that the design be such that the plant could be taken from power operation to cold shutdown on the RHR using safety grade equipment. This position would impose requirements on the equipment design and fabrication for new plants that is consistent with our present basis for considering other equipment that is important to safety. Without these requirements, such equipment would not have defined quality standards, and in large part, would not be reviewed by the staff.

As the study of long-term lessons learned progresses, we will keep the Committee informed of the impact on our position with regard to the RHR systems.

Original signed by
Roger J. Mattson

for Harold R. Denton, Director
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