



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

SEP 15 1983

MEMORANDUM FOR: ~~Darnell G. Eisenhut, Director~~
Division of Licensing

FROM: Richard H. Vollmer, Director
Division of Engineering

SUBJECT: BOARD NOTIFICATION REGARDING WESTINGHOUSE
REACTOR COOLANT PUMP SEALS

This memo supercedes my memo dated September 6, 1983 on the subject board notification.

The Westinghouse Owners Group initiated a test program in June 1983 to determine the survivability of the reactor coolant pump (RCP) secondary seals under conditions wherein seal cooling is lost. The secondary seals were thought to be the weak components in the design of the RCP seal. Their failure under a loss of cooling condition could lead to a small break LOCA resulting from failure of the complete RCP seal.

The secondary seal survivability test program has now progressed through test number four. These tests have not been successful in confirming the ability of the secondary seals which consist of O-ring and channel seals to survive under loss of cooling conditions. Two of the four tests resulted in O-ring blow-out with complete loss of sealing ability and two tests, although maintaining sealing ability, resulted in moderate to severe damage to the seals.

Westinghouse believes that their O-ring and channel seal test rig does not represent the actual design or loss of cooling conditions in the RCP, and therefore Westinghouse believes that the results of these tests are inconclusive. Westinghouse is now proposing to the Owners Group that changes be made to the test rig which will eliminate these differences. At the present time the staff does not have enough information to either agree or disagree with Westinghouse conclusions regarding the results of the first four tests.


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Experience data from Westinghouse pumps show RCP seal survival under loss of cooling conditions for a period of up to 65 minutes with no abnormal leakage. There are other instances of interruptions of cooling function for periods of 45, 30, and 10 or less minutes also with low leakage. In addition, Westinghouse has presented O-ring experience data from valve tests at 550°F and 2250 psig which show survival of ethylene propylene O-rings up to 10 hours.

Westinghouse has committed to supply the staff with additional information which will include a schedule for further testing and analysis. The staff is independently pursuing an analysis of the problem as well as further testing of the RCP seal failure mechanisms. The staff will meet with Westinghouse and the Westinghouse Owner's Group September 30, 1983 to discuss the RCP seal problem and decide on a course of action for further testing and analysis. In addition we have involved Region IV in this problem and they are scheduling audits of both the Westinghouse pump manufacturing facility and their seal vendor, Stein Seal Company. Members of NRR and RES will accompany Region IV personnel on these audits. In any event, the results of any further Westinghouse Owners Group testing and analysis will most probably not be complete until the end of 1983. Until the staff has had an opportunity to access these results and other information being developed, the integrity of the RCP seal under long term loss of cooling conditions can not be confirmed. We will keep you informed regarding the further progress of this issue.

However, since the current Westinghouse Owners Group test results indicate the possibility for a RCP seal failure under loss of cooling conditions, we recommend board notification of this issue.


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