



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

JUN 20 1979

Mr. O. B. Falls
Consultant
NucleDyne Engineering Corporation
728 West Michigan Avenue
Jackson, Michigan 49201

Dear Mr. Falls:

Thank you for your letter dated May 14, 1979. I will also take this opportunity to respond to your letter to Mr. Victor Stello dated May 15, 1979.

We have briefly reviewed your letter and its enclosures. We note the refinements included in the new Passive Containment System design which you have designated PCS-2. Our brief review of this information and your earlier submittals does not lead us to believe the accident at Three Mile Island, Unit 2 would have been avoided or mitigated by the use of the Passive Containment System. We are enclosing a copy of NUREG-0560, "Staff Report on the Generic Assessment of Feed-water Transients in Pressurized Water Reactors Designed by the Babcock and Wilcox Company," May 1979. We believe the findings of this report support this conclusion.

At Three Mile Island the plant did not respond as designed to the loss of feed-water because both of the auxiliary feedwater trains were valved out of service. Auxiliary feedwater flow was initiated by opening the closed valves about eight minutes after the start of the transient. We note with interest the new feature in PCS-2 by which you provide automatic makeup to the steam generator by the alternate decay heat removal system. However, we believe that the PCS-2 final design would have isolation valves similar to those employed at Three Mile Island and therefore would be subject to the same operator error.

At Three Mile Island the pressurizer relief valve which opened during the initial pressure surge failed to close when the pressure decreased below the closure set point. This is equivalent to the reactor coolant system experiencing a very small loss-of-coolant accident. The emergency core cooling system actuated when the reactor coolant system pressure fell to 1600 pounds per square inch; thus high pressure emergency coolant was being supplied about three minutes after the start of the transient and the system was operated intermittently thereafter. In reviewing the PCS-2 system design, we believe that with your proposed system the high pressure in the primary coolant system would have delayed initiation of coolant injection for a substantially longer period of time.

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Fundamentally, the temporary interruption of feedwater to the steam generators and the very small loss-of-coolant accident caused the primary coolant system at Three Mile Island to heatup and become saturated. Successful mitigation of the event required that decay heat be removed from the primary coolant either by heat transfer to the steam system through the steam generators or by energy discharge through the break with adequate emergency core coolant makeup. At Three Mile Island, blowdown from the stuck open pressure relief valve was not sufficient to initially remove all of the core decay heat. There was inadequate injection from the high pressure emergency core cooling system because of the relatively high reactor coolant system pressure apparently coupled with insufficient information for the plant operators to fully understand the conditions within the primary system. Also, the steam generators failed to return the primary coolant to subcooled conditions although feedwater was available.

The information you have provided emphasizes the capability of the Passive Containment System to mitigate a large break loss-of-coolant accident. However, we find little information on the ability of your proposed system to cope with a small loss-of-coolant accident, such as occurred at Three Mile Island. Thus, one of our concerns about the Passive Containment System remains its response to a small break in the primary system. (See Item 5 of the Enclosure to our letter to you dated February 21, 1978.) Therefore, we do not perceive any advantage to the Passive Containment System which might have altered the results of the Three Mile Island event.

In summary, we find nothing that changes our views or priorities as communicated to you in the past. However, our review of the Three Mile Island event is continuing and we have established a number of task action groups to review all facets of our licensing procedures. I have asked Dr. Roger Mattson, Director, Division of Systems Safety, to briefly review the Passive Containment System concept in connection with his activities as leader of the Lesson Learned Study.

Sincerely,

Original Signed By
H. R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosure:
NUREG-0560

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