UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

October 12, 1979

D. B. Vassallo, Acting Director, Division of Project Management

SUBJECT: ACRS QUESTIONS RELATING TO CERTAIN NEAR-TERM OL PLANTS (DIABLO CANYON, ZIMMER, SEQUOYAH, AND MCGUIRE)

Attached for your use are the questions which have been prepared for consideration during the anticipated ACRS Subcommittee meetings for near-term operating licenses on the Diablo Canyon, Zimmer, McGuire, and Sequoyah nuclear plants.

Please let me know when your staff can be prepared to discuss these issues so that we can proceed with ACRS consideration of these projects.

A written response is preferred but the Subcommittee would be prepared to discuss these matters orally to facilitate progress on these matters.

R. Savio

Richard Savio
Staff Engineer
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R Major

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Attachment:
As stated

ACRS QUESTIONS RELATING TO CERTAIN NEAR-TERM OL PLANTS
(DIABLO CANYON, ZIMMER, SEQUOYAH, AND MCQUIRE)

I. DIABLO CANYON AND SIMILAR PLANTS:

1. What if anything does the NRC Staff think may warrant special consideration because of seismic considerations?

2. Has the Staff considered whether special considerations are required with regard to operator response for a severe earthquake?

3. What anomalies in system behavior during an earthquake should operators be trained to handle? Is anything special required because of the failure of non-seismically qualified equipment?

4. What are the assumptions concerning the failure of non-seismic Class I piping? To what extent can the failure of such piping be tolerated?

5. Is anything special required with regard to reliability of connections to the Refueling Water Storage Tank for the earthquake situation? What criteria do the connections meet?

6. What significance is attached (if any) to recent cases of pipe cracking in stagnant borated water lines as it applies to earthquakes?

7. What consideration does the Staff believe appropriate for system degradation, such as the recent feedwater nozzle cracking experience, as it applies to inservice inspection programs for plants in areas of high seismic activity?

8. What are the seismic classes of:

   a. PORV
   b. Block Valve
   c. Equipment related to the operability of these devices
   d. Pressurizer heaters and related equipment

9. What are the specific recommendations for the Auxiliary Feedwater System at Diablo Canyon? What is the dependence on AC power?

10. Are there seismic effects in the control room which require attention? Has special consideration been given to structures, equipment, and instrumentation in the control room for an earthquake situation? For example: Has the ceiling been analyzed? Will lighting be adequate? Will lighting fixtures and lights remain in place?

11. What is the status of control room instrumentation displays, how rapid is the plant process computer (delay between printing and real time), and what effect would an earthquake have?

12. How comprehensive are tests for electrical transients during an earthquake and what is the effect on equipment? What is the reliability of both off-site and on-site power?

13. What are the Staff conclusions regarding technical support capabilities for Diablo Canyon.

ZIMMER AND SIMILAR PLANTS:

1. What are the Staff's specific recommendations on BWRs as they related to TMI Implications - Lessons Learned? How will they be implemented?

2. What has been the review for the reliability of decay heat removal systems for anomalous transients?

3. Has the Staff reviewed procedures for transients and accidents? What has been the conclusion?

4. What has been the NRC Staff's consideration of the advantages and disadvantages of a filtered and vented containment (see attached, "Additional Comments" from Interim Report No. 3 on Three Mile Island Nuclear Unit 2, May 16, 1979)?

5. Are there procedures for cases where one train of a system is down for maintenance and the other train fails?

6. During transients, what actions could an operator take to further aggrevate a situation? Are there procedures noting actions operators should not take?

7. What in the way of a systems interactions study has been performed at Zimmer? How is the potential for adverse systems interactions explored?

8. What is the type of display and use of instrumentation describing the status of the core?

9. How fast can the plant process computer respond to severe transients? How close to real time is the printed output in the control room?

10. To what extent has the Staff considered anomalous feedwater transients, such as overfill, in BWRs?

III. SEQUOYAH AND MCGUIRE AND SIMILAR ICE CONDENSER/UHI PLANTS

1. Discussion as to special features of the ice condenser/UHI plants which would require considerations in the light of the TMI-2 accident. The discussion should include hydrogen control and inert gas blockages in the primary system.

2. Discussion as to the information which would be available to the operator in the control room in the event of a severe transient.

3. Discussion of the NRC Staff's review of the emergency control room procedures for Sequoyah and McGuire.

4. Status of the NRC Staff's review of possible plant transients, including a discussion as to what extent the Staff has looked at ways in which operator action may increase the consequences of the transients.

5. Discussion as to the reliability of the decay heat removal systems following anomalous transients.

6. What has been the NRC Staff's consideration of the advantages and disadvantages of a filtered and vented containment?

7. What are the specific recommendations for the auxiliary feedwater systems for Sequoyah and McGuire? What is the dependence on AC power?

Additional comments by Messrs. H. Lewis, D. Moeller, D. Okrent, and J. Ray are presented below.

Sincerely,

Max W. Carbon
Chairman

Additional Comments by Messrs. H. Lewis, D. Moeller, D. Okrent, and J. Ray

The potential for a reduction in risk to the public in the case of a serious reactor accident by the implementation of a means for controlled, filtered venting of a containment which could retain particulates and the bulk of the iodine has been recognized for more than a decade. The concept was recommended for study more recently in the American Physical Society Report on light-water reactor safety and in the Ford Foundation-Mitre Report, "Nuclear Power - Issues and Choices." It is a high priority item in the NRC plan submitted to Congress for Research to Improve the Safety of Light-Water Nuclear Power Plants (NUREG-0438). The study performed for the State of California on underground siting concluded that filtered, vented containment was a favored option to explore in connection with possible means to mitigate the consequences of serious reactor accidents. However, little progress has been made on the development of sufficiently detailed design information on which to evaluate the efficacy and other factors relevant to a decision on possible implementation of such consequence ameliorating systems.

The TMI-2 accident suggests that the probability of a serious accident in which a filtered vented containment could be useful is larger than many had anticipated.

We recommend that the Commission request each power reactor licensee and construction permit holder to perform design studies of a system which adds the option of filtered venting or purging of containment in the event of a serious accident. The system should be capable of withstanding a steam and hydrogen environment and of removing and retaining for as long a time as necessary radioactive particulates and the great bulk of the iodine for accidents involving degraded situations up to and including core melt. Such studies could be done generically for several reactor-containment types, and should evaluate the practicality, pros and cons, the costs, and the potential for risk reduction. A period of about twelve months for a report to the NRC by licensees and construction permit holders appears to represent a possible schedule.