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Mr. J. J. Mattimoe
Assistant General Manager and
Chief Engineer
Sacramento Municipal Utility District
6201 S Street
P. O. Box 15830
Sacramento, California 95813

Dear Mr. Mattimoe:

SUBJECT: NUREG-0737, ITEMS II.F.1.4, II.F.1.5 AND II.F.1.6 - SER
CORRECTIONS

Our July 28, 1982 letter transmitted a Safety Evaluation Report (SER) on NUREG-0737 Items II.F.1.4, "Containment Pressure Monitor", II.F.1.5, "Containment Water Level Monitor", and II.F.1.6, "Containment Hydrogen Monitor". The SER (page 7) incorrectly contained two sentences applicable to boiling water reactors.

Enclosed is a revised SER correcting these sentences. Additional clarifications have also been added to indicate that the SER applies to modifications to be made during the next refueling outage.

Sincerely,

"ORIGINAL SIGNED BY
JOHN F. STOLZ"

John F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

Enclosure:
SER

cc w/enclosure:
See next page

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Sacramento Municipal Utility
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION OF THREE TMI ACTION PLAN ITEMS (NUREG-0737)

II.F.1.4 CONTAINMENT PRESSURE MONITOR

II.F.1.5 CONTAINMENT WATER LEVEL MONITOR

II.F.1.6 CONTAINMENT HYDROGEN MONITOR

Rancho Seco Nuclear Generating Station, Unit 1

Docket No. 50-312

Sacramento Municipal Utility District

Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission

1.0 BACKGROUND

By our letter of September 5, 1980 (Reference 1) to: (1) licensees of operating plants; (2) applicants for operating licenses; and (3) holders of construction permits, we issued a summary listing of all the approved Plan Requirements. Based on our study of the TMI accident, we have concluded that compliance with these requirements is necessary for safe reactor operation. In November 1980, we issued NUREG-0737, Clarification of TMI Action Plan Requirements (Reference 2), which supercedes Reference 1, and which specifies the minimum requirements for all TMI Action Plan Items being implemented. This Safety Evaluation (SE) addresses three of the TMI Action Plan Items, II.F.1.4, 5, 6.

2.0 SCOPE OF REVIEW

This SE addresses all the requirements of II.F.1.4, 5, and 6, except the following:

- (1) Clarification (1) of Each Item. The staff's review of this clarification item will be performed under the equipment qualification program.
- (2) Implementation Schedule. NUREG-0737 required that the three items addressed in this SE be implemented by January 1, 1982. Verifying that the implementation schedule is acceptable is not part of this SE.

3.0 II.F.1.4 CONTAINMENT PRESSURE MONITOR

3.1 NUREG-0737 POSITION

A continuous indication of containment pressure shall be provided in the control room of each operating reactor. Measurement and

indication capability shall include three times the design pressure of the containment for concrete (four times the design pressure for steel) and -5 psig for all containments.

3.2 NUREG-0737 CLARIFICATION

- (1) Design and qualification criteria are outlined in Appendix B of NUREG-0737 [As stated in section 2.0, this clarification will be reviewed under the environmental qualification program.]
- (2) Measurement and indication capability shall extend to 5 psia for subatmospheric containments.
- (3) Two or more instruments may be used to meet the range requirements. However, instruments that need to be switched from one scale to another scale to meet the range requirements are not acceptable.
- (4) Continuous display and recording of the containment pressure over the specified range in the control room is required.
- (5) The accuracy and response time specifications of the pressure monitor shall be provided and justified to be adequate for their intended function.

3.3 EVALUATION

The licensee has described the design for the Containment Pressure Monitor System (CPMS) in References 3 to 5. Our review of the licensee's submittals consisted of checking for deviations from our requirements which are stated in Sections 3.1 and 3.2 above, and of reviewing the adequacy of the accuracy and response time specifications of the CPMS. After reviewing the licensee's submittals, we find that the proposed CPMS to be installed during the next refueling outage meets all the requirements of Sections 3.1 and 3.2 above, except

the following: The licensee will not install a full range pressure recorder in the control room, but will have the following recording capability:

- a. The pressure will be logged on a high speed line printer every 12.5 milliseconds by the plant computer. Under accident conditions the line printer will be about three seconds behind real time on its printout. The line printer is just through an open door from the control room, and it would take the operator about 15 seconds to go back to examine the pressure log printout.
- b. There will be a strip chart recorder in the control room which records pressures up to the containment design pressure.
- c. There will be 18 trend recorders in the control room, any one of which can be used to record pressure over the full range. If necessary, one of these trend recorders could be administratively declared to be a dedicated pressure recorder.

We find that those measures adequately meet the requirement that there be a full range pressure recorder in the control room.

The CPMS indicator and recorder are separate devices. The indicator CPMSs chosen by the licensee have a system accuracy of 0.57% of full scale and a response time of 0.32 sec. The computer CPMSs chosen by the licensee have a system accuracy of 0.26% of full scale and a system response time of 0.2 sec. These values, which are consistent with the present state of the art, will provide information over the intended range of the CPMS that is sufficiently accurate and useful to allow the plant operator to adequately assess pressure conditions within the containment.

We conclude that the CPMS design is acceptable.

4.0 II.F.1.5 CONTAINMENT WATER LEVEL MONITOR

4.1 NUREG-0757 POSITION

A continuous indication of containment water level shall be provided in the control room for all plants. A narrow-range instrument shall be provided for PWRs and cover the range from the bottom to the top of the containment sump. A wide-range instrument shall also be provided for PWRs and shall cover the range from the bottom of the containment to the elevation equivalent to a 600,000 gallon capacity. For BWRs, a wide range instrument shall be provided and cover the range from the bottom to five feet above the normal water level of the suppression pool.

4.2 NUREG-0737 CLARIFICATION

- (1) The containment wide-range water level indication channels shall meet the design and qualification criteria as outlined in Appendix B of NUREG-0737. The narrow-range channel shall meet the requirements of Regulatory Guide 1.89.
[As stated in section 2.0, this clarification will be reviewed under the environmental qualification program]
- (2) The measurement capability of 600,000 gallons is based on recent plant designs. For older plants with smaller water capacities, licensees may propose deviations from this requirement based on the available water supply capability at their plant.
- (3) Narrow range water level monitors are required for all sizes of sumps but are not required in those plants that do not contain sumps inside the containment.

- (4) For BWR pressure-suppression containments, the Emergency Core Cooling System (ECCS) suction line inlets may be used as a starting reference point for the wide range water level monitors, instead of the bottom of the suppression pool.
- (5) The accuracy requirements of the water level monitors shall be provided and justified to be adequate for their intended function.

4.3 EVALUATION

The licensee has described his design for the Containment Water Level Monitoring System (CWLMS) in References 3 to 5. Our review of the licensee's submittals consisted of checking for deviations from our requirements which are stated in Section 4.1 and 4.2 above, and of reviewing the adequacy of the accuracy specifications for the CWLMS.

After reviewing the licensee's submittals, we find that the CWLMS design meets all the requirements of Sections 4.1 and 4.2 above.

The licensee has installed a narrow range CWLMS in the sump and a wide range CWLMS in the containment. The narrow range CWLMS has an indicator, but no recorder. The indicator has an accuracy of 0.93% of full scale. The wide range CWLMS has an indicator, but no recorder. The indicator has an accuracy of 0.93% of full scale. This value, which is consistent with the present state of the art, will provide information over the intended range of the CWLMS that is sufficiently accurate and useful to allow the plant operator to adequately assess water level conditions.

We conclude that the CWLMS design is acceptable.

5.0 II.F.1.6 CONTAINMENT HYDROGEN MONITOR

5.1 NUREG-0737 POSITION

A continuous indication of hydrogen concentration in the containment atmosphere shall be provided in the control room. Measurement capability shall be provided over the range of 0 to 10% hydrogen concentration under both positive and negative ambient pressure.

5.2 NUREG-0737 CLARIFICATION

- (1) Design and qualification criteria are outlined in Appendix B of NUREG-0737. [As stated in section 2.0, this clarification will be reviewed under the environmental qualification program.]
- (2) The continuous indication of hydrogen concentration is not required during normal operation.

If an indication is not available at all times, continuous indication and recording shall be functioning within 30 minutes of the initiation of safety injection.

5.3 EVALUATION

The licensee has described his design for the Containment Hydrogen Monitor System (CHMS) in the References 3 to 5. Our review of the licensee's submittals consisted of checking for deviations from our requirements which are stated in Sections 5.1 and 5.2 above, and of reviewing the adequacy of the accuracy specifications for the CHMS, and of reviewing the adequacy of the hydrogen sample port placement for the CHMS. After reviewing the licensee's submittals, we find that the CHMS design meets all the requirements of Sections 5.1 and

5.2 above, except the following: For the time being, the hydrogen monitor recording will be on the computer. The licensee intends to install a dedicated hydrogen strip chart recorder in the control room during the September 1982 refueling outage. Meanwhile, if a hydrogen concentration strip chart record is required, the hydrogen level can be recorded on one of the trend recorders. Since the licensee intends to upgrade the requirements of Sections 5.1 and 5.2 above, we find his temporary recording capability acceptable.

The CHMS indicator and computer-recorder are separate devices. The indicator CHMSs chosen by the licensee have a system accuracy of 5.0% of full scale and the computer-recorder CHMSs have an accuracy of 5.0% of full scale. These values, which are consistent with the present state of the art, will provide information over the intended range of the CHMS that is sufficiently accurate and useful to allow the plant operator to adequately assess the hydrogen concentration within the containment. The licensee will install two hydrogen sample ports within containment which permit rapid detection of hydrogen escaping from the reactor.

We conclude that the CHMS design is acceptable.

6.0 CONCLUSION

Except for the review of clarification (1) and a review of the implementation schedule, the licensee has met all the requirements of NUREG-0737 for items II.F.1.4, 5, and 6; we find his design for these three items acceptable.

7.0 REFERENCES

- 1) Letter from D. G. Eisenhut, NRC, to All Licensees of Operating Plants and Applicants for Operating Licenses and Holders of Construction Permits, dated September 5, 1980, Subject: Preliminary Clarification of TMI Action Plan Requirements.
- 2) NUREG-0737, "Clarification of TMI Action Plan Requirements," U. S. Nuclear Regulatory Commission, dated November, 1980.
- 3) Letter from J. J. Mattimoe (SMUD) to Office of NRR (NRC), dated December 15, 1980.
- 4) Phone conferences held during the period March 19-25, 1982 among Mark Padovan, Peter Kapo (NRC) and Jeff Weaver (SAND).
- 5) Letter from J. J. Mattimoe (SMUD) to Office of NRR (NRC), dated June 11, 1982, Subject: Confirmation that the Record of the Telephone Conferences held on March 19 and March 25, 1982 is correct.