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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION SUPPORTING AMENDMENT NO. 50 TO FACILITY OPERATING LICENSE NO. DPR-54 SACRAMENTO MUNICIPAL UTILITY DISTRICT RANCHO SECO NUCLEAR GENERATING STATION DOCKET NO. 50-312

1.0 Introduction

By letter dated July 26, 1983, Sacramento Municipal Utility District, the licensee, requested a change to the Rancho Seco Technical Specifications (TSs) involving the time delays associated with the protective circuits provided to prevent the safety-related electrical loads from being exposed to harmful degraded voltages. Specifically, the licensee proposed a new set of time delay values for TS Table 3.7-1. The voltage setpoints remain unchanged.

The licensee also provided supplemental technical information which included: Engineering Change Notice (No. A-2010E, Rev. 2, dated July 7, 1983), the associated Design Basis Report (dated July 22, 1983), and the technical instruction manual for the solid-state undervoltage relays being used (ITE-27 inverse time delay, Brown Boveri Electric publication 1B 18.4.7-2 Issue D). The licensee also provided supplemental information in a letter dated July 28, 1983.

The licensee conducted tests to better define the performance characteristics of the undervoltage relay. The test results were given to the staff in a telecon on July 29, 1983. After discussions with the staff, the licensee submitted a revised proposed change to the TSs in a letter dated July 29, 1983.

The licensee requested expedited NRC action on this request because compliance with Table 3.7-1 could not be demonstrated, as it presently exists. Prompt resolution of the situation is required to avoid delaying restart of the plant, which is presently anticipated to be August 3, 1983.

2.0 Evaluation of Emergency Cincumstances

The licensee did not discover that the undervoltage relay surveillance test points in the current Technical Specifications needed to be changed until the equipment associated with the undervoltage protective circuitry was installed and subsequently tested. The licensee stated that the timing for installation and testing of the modification

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The licensee stated that as soon as they discovered the problem early in July, they initiated an internal request to change the Technical Specifications. They also, early in July, contacted the NRC to discuss the problem and review alternate approaches. In addition, they initiated additional testing to obtain data to engineer an acceptable solution.

. Subsequent to completion of the testing, a number of conference calls with the NRC to discuss the problem, and review of the proposed Technical Specification change by the Plant Review Committee and the Management Safety Review Committee on July 25, 1983, the licensee submitted its license amendment request by telecopy on July 26, 1983.

3.0 Evaluation

The licensee has stated that after the final design was completed and equipment procured and installed, testing was started. During the testing, the licensee identified a difficulty in testing the time delay at 100% of the undervoltage setpoint. The undervoltage setpoint has a \pm 1% tolerance and for testing purposes hence cannot be fully depended upon to trip at a particular point within this band of uncertainty. Therefore, the licensee proposed to test the relay at a set of four values up to 98% of the setpoint.

In our review of the technical information, we identified that the relay manufacturer does not specify how the device will perform between 90% and 100% of its setpoint (81.5 and 90.5% of nominal bus voltage). The licensee has since conducted tests to determine the relay performance in this region. Our analysis of the test results indicates that: (1) the performance is now well defined, (2) the actual performance closely approximates the desired performance, and (3) between 99% and 100% of setpoint, the tested relay demonstrated a repeatability of time delay response on the order of 1-2%. Further, the licensee has stated that the variation of time delay performance he has observed in testing a number of relays is small. This performance is discussed in the enclosed Technical Evaluation Report by our consultant, Lawrence Livermore National Laboratory.

We also identified other questions about the performance of the degraded voltage protection. These included: (1) the possibility of shedding away from the preferred offsite power unnecessarily if the time delay were only 4.3 seconds at 98% of setpoint (i.e., 83.7% of

nominal bus voltage), (2) justification for extending the time delay on overvoltage from 3 seconds to 8 seconds, and (3) impact of small changes in the design. Each of these matters is discussed in the enclosed report by our consultant. Each of these questions is resolved to our satisfaction.

The setpoint for the undervoltage relays and the + 1% tolcrance correspond to a range of grid voltages between 218 KV and 214 KV. While trip action can be assured to occur at some point in this range of uncertainty, it cannot be garanteed at any particular point. Since operation below 218 KV should not be allowed indefinitely, actions are provided in the TSs to cover the case where the grid is slightly below 218 KV and the undervoltage relays have not tripped. The licensee has proposed a change in these actions. The central feature of the proposed actions is that if either the grid remains below 218 KV for 8 hours or falls below 216 KV, and protective shedding away from the offsite power has not occurred automatically, one electrical division will be manually transferred to its onsite power source for the next 24 hours. This configuration provides maximum flexibility and hence the greatest assurance that at least one of the two redundant electrical divisions will remain operable on a continuing basis. The proposed actions are more conservative and hence increase the margin of safety. Therefore, these proposed changes are acceptable.

4.0 Results

Based upon our direct involvement in the review of the licensee's proposed changes and upon our review of the enclosed Technical Evaluation Report by our consultant, we conclude that the performance of the degraded voltage protection circuitry is now well defined and closely approximates that which was previously reviewed and accepted. The proposed TS surveillance tests are adequate to periodically demonstrate that the equipment is performing within pre-established limits. There is no decrease in the margin of safety. Therefore, the licensee's proposed changes are acceptable.

The proposed actions to be taken in the event that the grid should fall slightly below 218 KV and undervoltage trip action has not occurred results in an increase the safety margin, and therefore, also are acceptable.

5.0 Environmental Considerations

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR \$51.5(d)(4), that an environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

6.0 Final No Significant Hazards Consideration Determination

The State was informed by telephone of our proposed no significant hazards consideration determination August 2, 1983. The State contact had no comments on the proposed determination. Based on our review of the licensee's submittals as described in our above evaluation and for the reasons stated below, we have made a final determination that the licensee's amendment request does not involve a significant hazards consideration.

The licensee conducted tests to better define the performance characteristics of the undervoltage relay. Our review of the test results indicates that (!) the performance is now well defined, and (2) the actual performance closely approximates the performance which we previously reviewed and accepted. The proposed TS surveillance tests are adequate to periodically demonstrate that the equipment is performing within pre-established limits. Therefore, there is no decrease in the margin of safety.

With regard to continued operation when the grid voltage falls below 218 KV, the proposed TSs provide a maximum flexibility for the possibility that a problem develops with the operating diesel generator or a problem develops with the offsite power or the non-safety related portions of the onsite power distribution system. The proposed TSs provide the greatest assurance that the safety-related loads will not be lost due to degraded voltage and that at least one of the redundant electrical divisions will be powered in any eventuality. The proposed TSs are more restrictive than the current ones and provide for an increase in the margins of safety.

7.0 Conclusion

We have concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations. and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: August 3, 1983

Principal Reviewers: J. T. Beard, S. Miner.