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Docket Nos. 50-275
50-323

R. C. DeYoung, Assistant Director for Light Water Reactors, Group 1, L

PACIFIC GAS & ELECTRIC COMPANY - DIABLO CANYON POWER STATION, UNITS 1 & 2 - SECOND ROUND QUESTIONS

Plant Name: Diablo Canyon Units 1 and 2
Licensing Stage: Operating License
Docket Numbers: 50-275/323
Responsible Branch and Project Manager: LWR 1-3, T. Hirons
Requested Completion Date: March 29, 1974
Technical Review Branch Involved: Electrical, Instrumentation and Control Systems Branch
Applicant's Response Date Necessary for Completion of Next Action Planned on Project: May 10, 1974
Description of Response: Second Round Questions
Review Status: Complete

The enclosed questions were prepared by the L:RS, Electrical, Instrumentation and Control Systems Branch for transmittal to the applicant. This list reflects the results of our review of the application through Amendment 4. The responses to several of our first set of questions were either incomplete, inadequate, or in disagreement with established Regulatory positions. The enclosed list states the positions which we will be taking in our safety evaluation.

We request that a meeting be scheduled with the applicant shortly after his receipt of the enclosed questions. The agenda for the meeting will be:

1. Enclosed questions
2. Outstanding voluntary responses
3. Findings and concerns of EI&CS site visit
4. Drawing review PG&E and Westinghouse drawings

Original Signed By
Victor Stello
Victor Stello, Assistant Director
for Reactor Safety
Directorate of Licensing

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Enclosure:
Questions

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Enclosure

DIABLO CANYON POWER STATION
SECOND ROUND QUESTIONS

1.0 The response to Question 7.1 regarding the bases for not modifying the design to meet the single failure criterion is inadequate. In the "Definitions and Explanations" section of Appendix A to 10 CFR Part 50, it is stated that, "single failures of passive components in electric systems should be assumed in designing against a single failure." Furthermore, no distinction is made between whether such failures in electric systems affect an active component or a passive component in a fluid system. Where a single failure in an electric system can result in loss of capacity to perform a safety function, the effect on public safety must be evaluated. This is necessary regardless of whether the loss of safety function is caused by an active component failing to perform a requisite mechanical motion or by passive component performing an unnecessary mechanical motion.

Table 3.9-3A identifies three single motor operated valves whose failure can result in total loss of the system function and one motor operated valve whose failure would negate the addition of NaHO to the containment spray system. The four valves are:

	System	Service Description	Valve Identification
1.	SIS	RWST supply to SIS pumps	8976
2.	SIS	RWST supply to RHR pumps	8980
3.	SIS	SIS pump discharge to RCS cold leg loops	8835
4.	C.S.	NaHO spray additive supply line	8992

The Staff requires that a description of the design modifications, for the above identified valves, be provided that assures the single failure criterion is met. This requirement can be satisfied by the removal of electrical power to preclude mechanical motion.

2.0 Based on the response to Question 7.4 and the information in Sections 7.2.2 and 7.2.3 of the FSAR, we conclude that the reasons for not performing periodic response time testing of the reactor trip system and engineered safety features actuation system are without bases. You indicate that periodic testing is not required to assure that the actual response times are less that that assumed in the safety analyses. However, the entire solid state protection system is a new design for which there is no directly applicable experience to indicate periodic testing is not needed. Furthermore, Diablo Canyon will be one of the first nuclear power plants to operate with this new protection system equipment.

We conclude that until experience with the Diablo Canyon design or other identical nuclear plant designs demonstrates that the response times do not change over long intervals of operating experience, the response time testing should be repeated periodically, as specified in Section 4.1 of IEEE 338-1971.

The Staff's position is that appropriate revisions to the proposed technical specifications be provided for periodic response time testing to verify the validity of the response times assumed in the safety analysis.

3.0 We have concluded that the bases for not modifying the circuits for the motor operated isolation valves, between the accumulators and the primary coolant system, to provide automatic opening of the valves when the primary coolant exceeds a preselected value is inadequate. It is indicated in Subsection 16.4.5 that an accumulator may be isolated four hours for repairs during power operation.

Since from a safety viewpoint, an isolated accumulator is undesirable during reactor operation and since the need to isolate an accumulator during reactor operation has not been demonstrated, the proposed statement should be replaced with the following statements:

"For the purpose of performing check valve leakage testing, one accumulator at a time may be isolated for up to eight hours, provided the reactor is in the hot shutdown condition."

"The accumulators may be isolated during the performance of reactor coolant system hydrostatic tests."

Either revise your proposed Technical Specifications to include the statements suggested above or identify the need to isolate an accumulator during reactor operation. In the latter case, also include specifications that during the time the accumulator is isolated it shall remain capable of fulfilling its safety function if an accident occurs and that the discharge valve is opened by the safety injection signal.

The Staff also requires that a description be provided of the circuit modifications required to provide automatic opening of the motor operated isolation valves between the accumulator and the primary coolant system when the primary coolant exceeds a preselected value. The preselected value of pressure will be defined in technical specifications. It should be shown that below the pressure selected, the accumulators are not necessary to mitigate the consequences of a loss-of-coolant accident.

4.0 A recent incident has occurred at a nuclear power plant that indicates a design deficiency in the Fischer and Porter Company Electronic Differential Pressure Transmitters, Model 2495 and 2496. A significant number of the units were found to have failed internally. The through bolts on the process flanges failed with a subsequent loss of fill fluid under process pressures. As a result of a detailed metallurgical examination, it was recommended that the original bolts, AISI-4037 steel,

be replaced with 17-4PH stainless steel bolts of the 1025°F heat treat grade.

The FSAR indicates that Fischer and Porter, Models 2495 and 2496, are used in the Diablo Canyon Power Station. The above incident warrants a review of all Fischer and Porter, Models 2495 and 2496, transducers to determine that the design deficiency does not exist or is corrected if it does exist. Provide the results of the review and a description of any required corrective actions.

5.0 The response to Questions 3.25 and 3.26 is incomplete. Expand Table 3.10-1, of the FSAR, to include the following additional information:

A. Include the degree of compliance with IEEE Std 344-1971 for the following equipment:

   1. Fire Pump Controller
   2. Ventilation Control System (Logic)
   3. Ventilation Control System (Relay Cabinet)

B. Provide the following information for equipment where partial compliance with IEEE Std 344-1971 is indicated:

   1. Define the area of non-compliance
   2. Provide justification for non-compliance
   3. Provide the procedure and results of the seismic qualification tests for the Auxiliary Safeguards Cabinets and Instrument A-C Inverters.

The Staff concludes that the seismic testing of Westinghouse supplied electrical and control equipment as documented in WCAP-8021 is unacceptable. It cannot be determined that the equipment and instruments would perform to their design specifications and be operable during and after a seismic event. The bases used for establishing the functional integrity for the equipment tested are inconsistent. Insufficient information is provided to determine the consequences of abnormal changes during the seismic testing.

The Staff requires that the following information be provided to support the bases, tests, and conclusions as defined in WCAP-8021

1. Justification for not requiring that all equipment and systems tested perform, as designed, during and after a seismic test.

2. The consequences of any actions that occur due to abnormal operation of the electrical instruments or equipment, including the momentary interruption and/or actuation of electrical equipment. When abnormal changes occur in a system being tested and only representative channels are

monitored, provide the results of an analysis of any combination of failures in all channels and their consequences.

3. When signals shift or oscillate during seismic testing of instruments, provide the results of an analysis to indicate the consequences of a premature or delayed trip in relation to the accidents analyzed in Chapter 15 of the FSAR. The analysis must include the entire range that the instruments are required to provide protective functions in relation to their selected setpoints.

4. Provide the results of the effects of false initiation of a safety system, supporting system, or equipment by the abnormal conditions identified in items 2 and 3 above.