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SUBJECT: Forwards Westinghouse Rept WCAP-11117, Rev 2, "RHR Sys  
 Autoclosure Interlock Removal Rept for Diablo Canyon Nuclear  
 Power Plant."

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JAMES D. SHIFFER  
VICE PRESIDENT  
NUCLEAR POWER GENERATION

August 4, 1987

PGandE Letter No.: DCL-87-187

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Re: Docket No. 50-275, OL-DPR-80  
Docket No. 50-323, OL-DPR-82  
Diablo Canyon Units 1 and 2  
Removal of RHR System Autoclosure Interlock Function

Gentlemen:

As stated in PGandE letter dated September 5, 1984 (DCL-84-301), PGandE believes that the autoclosure interlock (ACI) function for the residual heat removal (RHR) suction valves should be removed, as this function has been a dominant contributor in the industry to the loss of decay heat removal capability. The NRC's AEOD case study on long-term decay heat removal ("Decay Heat Removal Problems at U.S. Pressurized Water Reactors," December 1985) also recommends modifying plant design to remove the autoclosure interlock function.

In a letter to PGandE dated January 23, 1985, the NRC requested additional information in order to complete their evaluation for removal of the RHR system ACI function. The requested information was obtained from Westinghouse, who performed the evaluation documented in Westinghouse report WCAP-11117, Rev. 2, "Residual Heat Removal System Autoclosure Interlock Removal Report for Diablo Canyon Nuclear Power Plant," dated July 1987. WCAP-11117, Rev. 2, is provided as Enclosure 2.

As described in the WCAP, justification for removal of the ACI function is based on a safety evaluation of the effects of the removal on (1) shutdown cooling overpressurization events, (2) RHR system availability, and (3) interfacing system LOCA potential at power. The results of the WCAP demonstrate that removal of the autoclosure interlock function, along with implementation of the recommended circuitry modifications described in Section 5 of the WCAP, will result in a net improvement in safety.

PGandE agrees with the Westinghouse evaluation and proposes to implement the recommended circuitry modifications, upon approval by the NRC. These modifications consist of (1) deleting the ACI function by removing the reactor coolant system pressure input from the RHR suction valve closing circuit, and (2) adding an alarm that will actuate on a high reactor coolant system pressure signal when either of the RHR suction valves is not fully closed.

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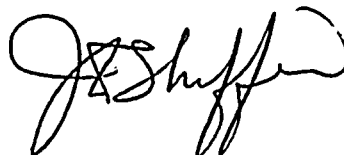
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The open permissive interlock will remain intact. Plant operating procedures will be modified to reflect the addition of the alarm. The alarm setpoint will be less than 450 psig (low temperature overpressurization actuation setpoint and RHR relief valve setpoint) and greater than 390 psig (RHR suction valve open permissive setpoint) and will account for instrument uncertainties.

Additionally, PGandE has performed a 10 CFR 50.59 evaluation and has determined that removal of the RHR autoclosure interlock function does not constitute an unreviewed safety question or change to the DCPD Technical Specifications. The evaluation for unreviewed safety questions and the environmental evaluation are provided in Enclosure 1. Because the NRC requested additional information for their evaluation, PGandE will not schedule removal of the ACI function until the NRC approves the proposed changes.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely,



Enclosures

cc w/Enclosure 1: L. J. Chandler  
M. M. Mendonca  
B. Norton  
CPUC  
Diablo Distribution

cc w/Encls 1, 2: J. B. Martin  
P. P. Narbut

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## ENCLOSURE 1

Evaluation for Removal of Autoclosure  
Interlock Function for RHR Suction Valves 8701 and 8702 on  
Diablo Canyon Units 1 and 2

A. EVALUATION FOR UNREVIEWED SAFETY QUESTIONS

This change will remove the autoclosure interlocks (ACI) on residual heat removal system (RHRS) suction valves 8701 and 8702 and add an independent control room alarm. This evaluation is based on the results of a Westinghouse report (WCAP-11117, Rev. 2) that applies probabilistic risk assessment methodology to the original design, the proposed design, and an alternative design. The changes and analyzed effects will be similar for both units. PGandE's evaluation focuses on the three criteria set forth in 10 CFR 50.59 and applies to both DCPD units.

1. Is the probability of an occurrence or the consequences of an accident or malfunction of equipment important to safety, as previously evaluated in the FSAR, increased?

Section 6.6 of WCAP-11117, Rev. 2, provides the conclusions from a probabilistic analysis of three areas: (1) the frequency of an interfacing system LOCA, (2) the availability of the RHRS, and (3) the effect on overpressure transients. The overall frequency of an interfacing system LOCA accident is decreased (from  $6.2E-07$ /year to  $5.8E-07$ /year) with removal of the autoclosure interlock and the addition of an independent control room alarm to alert operators for prompt corrective action. This frequency is a combination of frequencies at shutdown and at power conditions. Although the frequency of an interfacing system LOCA at shutdown conditions (through overpressurization of the RHRS) increased from approximately  $1E-14$ /year to  $1E-12$ /year from removal of the ACI, when this is added to the reduced interfacing system LOCA frequency at power conditions (from  $6.2E-07$ /year to  $5.8E-07$ /year), the increase at shutdown is insignificant compared to the decrease at power (due to the relative magnitude of the frequencies involved).

The demonstrated improvement in RHRS availability due to the elimination of spurious closure of the suction valves along with the reduction in the frequency of an overpressure event at shutdown (due to a decrease in the number of suction valve spurious closure events) further decreases the frequency of an accident. Therefore, this change does not involve an increase in the probability or consequences of accidents previously evaluated.

2. Is the possibility of an accident or malfunction of a different type than any previously evaluated in the FSAR created?





Section 15.0 of the Diablo Canyon FSAR Update states that the analysis of an RHRS overpressurization accident, requested in Reg. Guide 1.70, Rev. 1, is not necessary because the RHRS interlocks make overpressurization of the RHRS extremely unlikely.

The effect of an overpressure transient at cold shutdown conditions will not be altered by removal of the ACI function. With or without the ACI function, the RHRS could be subject to overpressure for which the RHRS relief valves must be relied upon to limit pressure to within RHRS design parameters. While it is true that the interlocks provide an automatic closure to the RHRS suction valves on high RCS pressure, overpressure protection of the RHRS is provided by the RHRS relief valves and not by the slow acting suction valves that isolate the RHRS from the RCS. The purpose of the interlocks is to ensure that there is a double barrier between the RCS and the RHRS when the plant is at normal operating conditions, i.e., pressurized and not in the RHRS cooling mode. Thus, the interlock safety function is to preclude conditions that could lead to a LOCA outside of containment due to operator error. The interlock safety function is not to isolate the RHRS from the RCS when the RHRS is operating in the decay heat mode.

There are several methods to ensure a double barrier between the RCS and RHRS when the plant is at normal operating conditions. Plant operating procedures would instruct the operator to isolate the RHRS during plant heatup. Alarms would be installed to annunciate a "valve not full closed" signal in conjunction with a "RCS pressure - high" signal (Figures 5-1 and 5-2 of Enclosure 2). The intent of these alarms would be to alert the operator that either of the RHRS isolation valves is not fully closed, and that the double isolation is not intact. Additionally, the alarm response guidelines and operator training would be revised. The open permissive interlock would not be changed and would still function to prevent opening of either of the RHRS suction valves when the RCS is at a pressure higher than the remaining open permissive interlock.

Thus, removal of the ACI function does not create the possibility of an accident different from that identified in the DCPD FSAR Update. RHRS overpressurization in shutdown modes is prevented by the relief capacity of the RHRS safety valves and the addition of alarms to warn the operator of a "valve not full closed." In the operating modes, the open permissive interlocks function prevents the opening of the RHRS suction/isolation valves when the RCS is at high pressure. The open permissive interlocks will not be affected by the proposed ACI removal.

3. Is the margin of safety, as defined in the basis for any Technical Specification, reduced?

The ACI function is not a consideration in the margin of safety as defined in the basis for any Technical Specification.



The removal of the ACI function does not impact any Technical Specification. The overpressure protection system described in the Technical Specifications ensures that the RCS will be protected from pressure transients that could exceed the limits of Appendix G to 10 CFR Part 50 when one or more of the RCS cold legs are less than or equal to 323°F.

The margin of safety provided by the RCS overpressure protection system would also extend to the protection of the RHRS when in service without dependence on the ACI. The RHRS relief valve provides further assurance that the RCS will not overpressurize in Modes 4, 5, or 6 when RHRS suction valves 8701 and 8702 are open.

B. ENVIRONMENTAL EVALUATION

This change is internal to existing plant structures. This change does not represent further development of the Diablo Canyon site. The change involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and there is no significant increase in individual or cumulative occupational radiation exposure. The proposed modification will not affect the environmental analyses in the FSAR Update, Environmental Report, or Final Environmental Impact Statement. Therefore, there are no unreviewed environmental questions involved.



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ENCLOSURE 2

WCAP-11117, Revision 2

Residual Heat Removal System Autoclosure  
Interlock Removal Report for Diablo Canyon  
Nuclear Power Plant

July 1987



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