

ENCLOSURE 1

SAFETY EVALUATION
SAN ONOFRE UNITS 2 AND 3 (SONGS 2 & 3)
CONTROL SYSTEM FAILURES

- References:
1. Letters from K. Baskin (SCE) to G. Knighton (NRC), dated April 1 and April 20, 1983
 2. Letters from M. Medford (SCE) to G. Knighton (NRC), dated September 15, 1983, November 30, 1983 and December 17, 1984
 3. NRC Request for Additional Information to CE from G. Knighton (NRC), dated August 27, 1984

The staff has reviewed the licensee's letters referenced above which were submitted in response to NRC questions 222.43 and 222.44 and subsequent requests for additional information. Respectively, these questions requested information on: (1) high energy line break (HELB) affects on control systems, and (2) the failure of any power sources, sensors, or sensor impulse lines which provide power or signals to two or more control systems. The requirements of these two questions are reflected in License Condition 2.C(12) for SONGS Unit 2 and 2.C(10) for SONGS Unit 3. While many of the concerns relating to these questions have been resolved by the licensee's submittals, the staff continues to consider portions of the HELB evaluation unacceptable. The following provides additional background and information on the staff's position related to these items.

Environmental Qualification of Control Systems (HELB Events -
Question 222.43)

Section 7.7.1 of the SONGS 2 & 3 SSER No. 4 (NUREG-0712) states that the licensee initiated a program to confirm that control system failures resulting from HELB events do not result in event consequences more adverse than those

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considered in the FSAR analyses for Chapter 15. This issue originated from IE Information Notice 79-22. The licensee concluded in various submittals that the consequences of HELB events on control systems are bounded by the FSAR analyses. The staff has challenged some of the bases for this conclusion as discussed below.

The licensee stated in their November 30, 1983 submittal that the calculational uncertainties placed on the bounding moderator temperature coefficient (MTC), bounding doppler coefficient, and bounding CEA worth used in the FSAR analyses are not included in the steam line break (SLB) analyses performed for the HELB study. The main concern is for post reactor trip return-to-power caused by steam line breaks with failures of the main feedwater control system and/or steam bypass control system. The staff informed (by letter dated August 27, 1984) the licensee that the removal of the FSAR calculational uncertainties from the conservatisms used in the HELB analyses was unacceptable and that the HELB analyses should be performed using the same conservative assumption values as used in the FSAR analyses unless additional information could be provided to support the current HELB evaluation. The licensee's response (dated December 17, 1984) to the staff's position maintains that the parameters and assumptions used in the HELB evaluation are conservative with respect to nominal values (normal plant operation) and acknowledged that some of the uncertainty bands had been removed. With this approach, the licensee has concluded that the FSAR analyses include adequate margin to cover the postulated malfunctions of control systems.

The staff does not find the additional information provided to be sufficient to justify the current HELB/control system interaction analyses. It is the staff's understanding that the conservative values used in the FSAR analyses were included to provide the most adverse conditions that might exist for scenarios that could complicate the postulated FSAR HELB events. Consequently, the FSAR HELB event scenarios associated with control system failure interactions should not be based on the removal of the existing FSAR calculational

uncertainties applied to the conservatisms unless such a removal was for the purpose of producing more adverse results. This has not been shown to be the case by the licensee to date. Therefore, the staff's position addressed above remains unchanged, and the staff continues to request that each postulated HELB event be analyzed where necessary based on the staff's position.

Another steam line break analysis issue addressed by the licensee warrants discussion. It is stated in the licensee's September 15, 1983 submittal that the steam bypass control system (SBCS) and reactor regulating system (RRS) malfunctions cannot occur simultaneously during a steam line break (SLB) event due to the presence of the automatic withdrawal prohibit (AWP) signal. The event scenario of concern is the failure of the SBCS such that a quick open signal is generated in combination with the RRS generating a control element assembly (CEA) withdrawal signal during a SLB inside containment. The generation of a quick open signal by the SBCS will produce an AWP signal which is sent to the control element drive mechanism control system (CEDMCS) to block its response to RRS demands to withdraw CEAs. The SBCS will (1) block a CEA withdrawal signal from the RRS if generated after the AWP command, or (2) terminate an automatic CEA withdrawal if already in progress upon receipt of an AWP. The licensee provided information to confirm that the SLB event common to the SBCS and RRS will not affect the control system interlocks circuitry. However, upon review of drawings supplied by the applicant to verify the RRS, SBCS, and CEDMCS interface, it was revealed that credit is being taken for a single, nonsafety-related interlock to prevent the simultaneous malfunction of the RRS and SBCS. The staff finds this unacceptable since nonsafety-related (control system) equipment should not be relied upon to remain functional for the mitigation of an event such as a SLB. Consequently, the staff's position is that the SLB event should be analyzed assuming simultaneous malfunctions for the SBCS and RRS to confirm that the event is not complicated beyond the FSAR analyses, or it must be demonstrated that the consequences of these malfunctions are acceptable. If unsuccessful, then design changes may be necessary and should be identified sufficiently to allow staff review.

Effects of Control System Failures (Failure of Power and
Signal Lines - Question 222.44)

Section 7.7.2 of the SONGS 2 & 3 SSER No. 4 (NUREG-0712) states that the licensee was requested to identify any power sources, sensors, or sensor impulse lines which provide power or signals to two or more control systems and to demonstrate that failures of these power sources, sensors, or sensor impulse lines will not result in consequences outside the bounds of the Chapter 15 analyses. The licensee has completed an in-depth analysis of system reactions related to this issue. The analysis results verified that the consequences of the postulated failures resulting in single and simultaneous malfunctions of control systems are bounded by current analyses reported in Chapter 15 of the FSAR. The staff, therefore, considers this issue resolved.

ENCLOSURE 2

EICSB/DBL SALP INPUT

PLANT: San Onofre Units 2 and 3

LICENSEE: Southern California Edison Company

DOCKET NOS: 50-361 and 50-362

LICENSEE STATUS: OR

SER SUBJECT: Control System Failures

PERFORMANCE PARAMETERS:

- (1) Management Involvement in Assuring Quality
- (2) Approach to Resolution of Technical Issues From a Safety Standpoint
- (3) Response to NRC Initiatives
- (4) Staffing (Including Management)
- (5) Reporting and Analysis of Reportable Events
- (6) Training and Qualification Effectiveness
- (7) Any Other SALP Functional Area

<u>PERFORMANCE PARAMETER</u>	<u>NARRATIVE DESCRIPTION OF APPLICANT/LICENSEE'S PERFORMANCE</u>	<u>CATEGORY/ RATING</u>
1	No basis for assessment.	N/A
2	Overall, viable and general sound approaches were taken to ensure that applicable requirements were met for the control system failure issues. However, the licensee has not readily provided sufficient information to aid the staff in its review of the HELB issue. The licensee has not demonstrated an adequate understanding of the staff's concerns related to the HELB issue. This has resulted in a delay in the resolution of the associated license conditions.	2
3	The licensee has not responded well to concerns raised by the staff. Information was provided in a timely manner but was not considered sufficient to readily resolve all the issues.	2
4 thru 7	No basis for assessment.	N/A

OVERALL APPLICANT/LICENSEE PERFORMANCE RATING 2