

## REGULATOR INFORMATION DISTRIBUTION SYSTEM (RIDS)

SUBJECT: Responds to programmed enhancements of Generic Ltr 88-17,  
"Loss of DHR."

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February 21, 1989

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

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362  
Response to Programmed Enhancements of Generic Letter No. 88-17  
San Onofre Nuclear Generating Station  
Units 2 and 3

References: A. Generic Letter No. 88-17, "Loss of Decay Heat Removal,"  
dated October 17, 1988  
B. Letter, dated January 5, 1989, from M. O. Medford (SCE)  
to the NRC, Response to Generic Letter No. 88-17, "Loss  
of Decay Heat Removal"

The referenced generic letter discusses the issue of loss of decay heat removal during non-power operation and requests licensees to provide information relevant to their planned actions to address the recommendations specified in the generic letter. The Southern California Edison Company (SCE) has provided its response to the "expeditious actions" portion of the generic letter by Reference B above.

The purpose of this letter is to provide SCE's response to the six "programmed enhancements" identified by the generic letter. This response describes additional enhancements that are planned to be implemented. Plant modifications will be completed prior to the end of the Cycle 6 Refueling Outage. Enhancements that do not depend on plant modifications will be

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February 21, 1989

implemented by April 30, 1990. As specified in the generic letter, SCE's response has been prepared in accordance with the requirements of 10 CFR 50.54(f).

Should you have any questions or comments regarding our response, please contact me.

Respectfully submitted,

By:

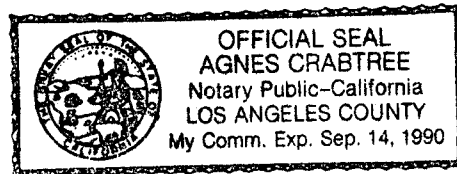
M. O. Medford

M. O. Medford  
Manager of Nuclear Regulatory  
Affairs

Subscribed and sworn to before me this  
21<sup>st</sup> day of February 1989.

Agnes Crabtree

Notary Public in and for the County of  
Los Angeles, State of California



Enclosure

cc: J. B. Martin, Regional Administrator, NRC Region V  
F. R. Huey, NRC Senior Resident Inspector, San Onofre Units 1, 2 and 3

SAN ONOFRE UNITS 2 AND 3  
RESPONSE TO  
PROGRAMMED ENHANCEMENTS OF GENERIC LETTER NO. 88-17

(1) Instrumentation

Provide reliable indication of parameters that describe the state of the RCS and the performance of systems normally used to cool the RCS for both normal and accident conditions. At a minimum, provide the following in the CR:

- (a) two independent RCS level indications,
- (b) at least two independent temperature measurements representative of the core exit whenever the RV head is located on top of the RV,
- (c) The capability of continuously monitoring DHR system performance whenever a DHR system is being used for cooling the RCS,
- (d) visible and audible indications of abnormal conditions in temperature, level, and DHR system performance.

Response:

- (a) Two independent, continuous, full range RCS water level indications with low level alarm capability will be provided in the control room. Both indications will be in service in the control room whenever the RCS is in a reduced inventory condition.
- (b) Two independent temperature indications of reactor core exit conditions will be in operation prior to entering an RCS mid-loop condition whenever the Reactor Vessel (RV) head is located on top of the RV.
- (c) Decay Heat Removal (DHR) system flow, temperatures and Low Pressure Safety Injection (LPSI) Pump motor amperage are continuously displayed in the Control Room.
- (d) Annunciation, both audible and visual will be provided for the following abnormal conditions:
  - i) RCS low level
  - ii) RCS high temperature
  - iii) DHR low flow
  - iv) Low DHR motor amperes

(2) Procedures

Develop and implement procedures that cover reduced inventory operation and that provide an adequate basis for entry into a reduced inventory condition. These include:

- (a) procedures that cover normal operation of the NSSS, the containment, and supporting systems under conditions for which cooling would normally be provided by DHR systems,
- (b) procedures that cover emergency, abnormal, off-normal, or the equivalent operation of the NSSS, the containment, and supporting systems if an off-normal condition occurs while operating under conditions for which cooling would normally be provided by DHR systems,
- (c) administrative controls that support and supplement the procedures in items (a), (b), and all other actions identified in the generic letter, as appropriate.

Response:

SCE has developed and implemented procedures which describe activities conducted during RCS draindown modes and operation with the RCS partially filled. A summary listing of those procedures is presented below:

S023-5-1.5, Plant Shutdown from Hot Standby to Cold Shutdown

S023-3-2.6, Shutdown Cooling System Operation

S023-3-1.8, Draining the Reactor Coolant System

S023-5-1.8, Shutdown Operations (Modes 5 and 6)

S023-3-2.8.1, Refueling Cavity Draining Operations

S023-5-1.3, Plant Startup from Cold Shutdown to Hot Standby

S023-3-1.4, Filling and Venting the Reactor Coolant System

AOI S023-13-15, Loss of Shutdown Cooling

In addition, a number of planned actions to address the expeditious actions of the generic letter issues, will be incorporated into the RCS drain procedure prior to initial draining of the RCS to a reduced inventory condition as specified in our response to the expeditious actions. The existing procedures and administrative controls are considered adequate and will continue to be implemented until revisions are made which result from plant modifications or analyses.

(3) Equipment

- (a) Assure that adequate operating, operable and/or available equipment of high reliability is provided for cooling the RCS and for avoiding a loss of RCS cooling.
- (b) Maintain sufficient existing equipment in an operable or available status so as to mitigate loss of DHR or loss of RCS inventory should they occur. This should include at least one HPSI pump and one other system. The water addition rate capable of being provided by each equipment item should be at least sufficient to keep the core covered.
- (c) Provide adequate equipment for personnel communications that involve activities related to the RCS or systems necessary to maintain the RCS in a stable and controlled condition.

Response:

Items (a) and (b)

Adequate operating, operable and/or available equipment of high reliability is provided for cooling the RCS and for avoiding a loss of RCS cooling. Prior to entering an RCS Reduced Inventory Condition, two means of adding inventory to the RCS will be required. This will be accomplished by having one High Pressure Safety Injection Pump operable and either a Containment Spray Pump, second High Pressure Safety Injection Pump, or Charging Pump available. In order to prevent Reactor Core uncover, use of a Charging Pump will be time dependent after shutdown because of its lower flowrate. Use of a Containment Spray Pump will require that an operator be dispatched to the pump for valve manipulation.

The Loss of Shutdown Cooling procedure will provide guidance to ensure makeup flow does not bypass the Reactor Core.

The reliability of pumps and valves in the DHR system, component cooling water system and salt water cooling system is demonstrated periodically by inservice testing of these components to the ASME Code Section XI requirements. The following motor operated valves have been MOVAT tested in accordance with IE Bulletin 85-03, Shutdown Cooling System (all valves), Low Pressure Safety Injection System (all valves), Component Cooling Water System (all valves except butterfly valves).

Item (c)

Various communication systems are employed to ensure reliable and adequate communication during all modes of operation as well as maintenance under normal and emergency conditions. The communication systems include a private telephone system, two way UHF radio, radio paging (commercial and local), and a public address system.

(4) Analysis

Conduct analyses to supplement existing information and develop a basis for procedures, instrumentation installation and response, and equipment/ NSSS interactions and response. The analyses should encompass thermodynamic and physical (configuration) states to which the hardware can be subjected and should provide sufficient depth that the basis is developed. Emphasis should be placed upon obtaining a complete understanding of NSSS behavior under non-power operation.

Response:

Areas which SCE intends to analyze are the following:

- i) Determination of hot leg vent path size versus number of days elapsed since plant shutdown.
- ii) Determination of required makeup water flow requirements versus number of days elapsed since plant shutdown.
- iii) Determination of loss of DHR RCS heatup rate.
- iv) Determination of loss of DHR containment pressurization rate.
- v) Confirm adequacy of the fuel transfer tube water seal to maintain containment integrity.
- vi) Determination of minimum DHR flow requirements.
- vii) Analysis of removal of high pressure closure contacts to the DHR suction valves.
- viii) Analysis to develop a basis for RCS level instrumentation installation and response (i.e., RCS level gradient correlation).

These planned analyses will be completed in sufficient time to permit any procedural enhancements and plant modifications required by the analyses to be completed by April 30, 1990 and the end of the Cycle 6 refueling outage, respectively.

(5) Technical Specifications

Technical Specifications that restrict or limit the safety benefit of the actions identified in the generic letter should be identified and appropriate changes should be submitted.

Response:

The Combustion Engineering Owners Group (CEOG) is investigating the impact of the generic letter with respect to Technical Specification requirements. Based on preliminary results of their work to date, certain areas have been identified as potentially being affected by the actions identified by the generic letter.

These areas are: Reduction of shutdown cooling flow rate during Mid-Loop Conditions and removal of auto-closure interlock on shutdown cooling suction valves. Removal of the auto-classic interlock has already been authorized as a CEOG task effort.

Technical Specification 3/4.4.1.4.2, "Cold Shutdown-Loops Not Filled" will be examined. A hot leg temperature restriction, as measured at the inlet to the shutdown cooling heat exchanger and minimum flow would be specified to ensure that the temperature at the heat exchanger does not lag the hot leg temperature by too long a time, and that damage to the LPSI pump(s) does not occur. Technical Specification 3/4.9.8.2 currently provides for a minimum shutdown cooling flow rate and would be examined for reduction. SCE has already pursued reducing the flow rate.

Technical Specification 3/4.1.1.2 would also be reviewed as part of this effort for removal of the requirement to lockout the charging pumps during mid-loop operation. These pumps would then be available for use as alternate decay heat removal sources.

SCE will follow this effort closely and will submit changes to technical specifications where warranted to achieve the desired relaxation.

(6) RCS Perturbations

Item 2.5 of the expeditious actions should be reexamined and operations refined as necessary to reasonably minimize the likelihood of loss of DHR.

Response:

As discussed in our response to item 2.5 of the expeditious actions, prior to entering an RCS Reduced Inventory Condition, RCS perturbation control will be implemented. An initial RCS Perturbation List will be established by reviewing "in progress" surveillances, procedures, and Work Authorizations to determine their potential threat to RCS stability. In addition, management approval will be required for all Work Authorizations which may impact reduced inventory or mid-loop operation. SCE policy is to delay such activities (whenever possible) until the RCS is not in a Reduced Inventory Condition. However, when such activities are identified and cannot be delayed, then extra measures will be taken as appropriate to the degree of threat. These measures will include actions to mitigate the loss of Reactor Core cooling and/or enhanced monitoring of critical parameters.

The RCS Perturbation List will be maintained current by reviewing daily revisions to the Work Authorization letter and all other activities within the cognizance of the operating shift. Those activities which cannot be delayed will be included on the list as previously described.



SCE has performed an evaluation to determine if it would be beneficial to tag the first isolation valve off the RCS/SDCS which could potentially drain the RCS. Based on this evaluation, it has been concluded that the use of permanent tags which uniquely distinguish the first isolation valve off the RCS/SDCS will be installed. The existence of these tags will be incorporated into plant operating procedures and the significance of these tags and valves will be taught to Maintenance and other support personnel prior to entering a Reduced Inventory Condition.

Additionally, SCE has extensive administrative controls which are designed to prevent the inadvertent mispositioning of valves. Based on past performance, it has been demonstrated that these controls provide high assurance that plant equipment is operated within approved guidelines.

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