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SUBJECT: Responds to eight recommended expeditious actions of Generic
 Ltr 88-17, "Loss of Decay Heat Removal."

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M. O. MEDFORD
MANAGER OF
NUCLEAR REGULATORY AFFAIRS

January 5, 1989

TELEPHONE
(818) 302-1749

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

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
Response to Generic Letter No. 88-17, "Loss of
Decay Heat Removal"
San Onofre Nuclear Generating Station
Units 2 and 3

Reference: Generic Letter No. 88-17, "Loss of Decay Heat Removal" dated
October 17, 1988

The referenced generic letter discusses the issue of loss of decay heat removal during non-power operation and requests licensees to provide information based on the guidance specified in the generic letter regarding planned actions in response to the recommendations. The approach recommends an immediate response and a development program to achieve an immediate reduction in the release of radioactive material due to a core damage accident (expeditious actions) and a longer term reduction in core damage probability (programmed enhancements). These actions and enhancements have been recommended as related to operation of the nuclear steam supply system during shutdown cooling or during conditions where such cooling would normally be provided. The request further specified that the response be prepared in accordance with the requirements of 10 CFR 50.54(f).

The purpose of this letter is to provide the Southern California Edison (SCE) Company's response to the eight recommended expeditious actions identified by the generic letter. SCE has prepared its response by describing its existing actions and by describing its planned actions to meet the generic letter recommendations. The existing actions are incorporated in the reactor coolant system (RCS) drain procedure and the planned actions will be incorporated

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January 5, 1989

prior to initial draining of the RCS to a reduced inventory condition. SCE's response to the programmed enhancements will be submitted under separate cover by February 1, 1989.

Should you have any questions or comments regarding this letter, please contact me.

Respectfully submitted,

By:

M O Medford

M. O. Medford
Manager of Nuclear Regulatory
Affairs

Subscribed and sworn to before me this
5th day of January, 1989.

C. Sally Sebo

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
EXPEDITIOUS ACTIONS OF GENERIC LETTER 88-17

(1) Diablo Canyon Event

Provide training shortly before entering a reduced inventory condition:

EXISTING ACTIONS:

Informal training/review of the reactor coolant system (RCS) drain-down evolution is accomplished during the preshift meetings prior to draining the RCS.

PLANNED ACTIONS:

Prior to entering an RCS Reduced Inventory Condition, each operating shift and Equipment Control personnel will receive training which covers plant operation while in such a condition. The purpose of this training will be to increase awareness of the complexities involved while operating with the Reactor Coolant System at Midloop. The training will include a discussion of related industry events (including the April 10, 1987 Diablo Canyon loss of residual heat removal (RHR) event), Containment closure control, methods of adding inventory to the RCS, establishing a Hot Leg vent path, indications for monitoring RCS level and temperature, and the necessity of maintaining control over those types of activities which could perturb stability of the RCS. This training will be accomplished within 30 days prior to entering a Reduced Inventory Condition and may be waived if completed within the previous six months. The training material will be periodically updated as the need occurs.

In addition, selected Maintenance personnel, and other support personnel when applicable, will be trained in the requirements and methods of Containment Closure. The frequency of this training will be the same as that for plant Operators.

(2) Containment Closure

Implement administrative controls to ensure Containment Closure capability:

EXISTING ACTIONS:

Prior to draining below the top of the RCS Hot Leg, an initial Containment Closure Impairment List is established by performing a Containment Building Penetration Status Verification surveillance and by reviewing the Work Authorization Letter. The Maintenance Department is required to signoff that they can provide Containment Closure within four hours. A list of departments and individuals responsible for Containment Closure activities is also established.

The Containment Closure Impairment List is maintained current by reviewing the daily revisions to the Work Authorization Letter. Equipment Control does not issue any new Work Authorizations affecting Containment Closure unless the Maintenance Department can provide closure within four hours. The Containment Closure Responsible Personnel List is maintained current on a shiftly basis.

PLANNED ACTIONS:

(Note that the following administrative controls are not applicable if the containment is maintained closed)

Prior to entering an RCS Reduced Inventory Condition, Containment Closure control will be implemented as stated in the Existing Actions, but with new requirements. With cold leg openings of one square inch or less, Containment Closure will be required within 2.5 hours of notice. With cold leg openings greater than one square inch, containment closure will be required within 45 minutes of notice, unless a valid hot leg vent has been established. If a valid hot leg vent path has been established, then with a cold leg opening of greater than one inch, containment closure will be required within 2 hours of initiation.

Valid hot leg vents include the pressurizer manway and the steam generator hot leg manway provided these vent paths are unobstructed. Other hot leg vents will be excluded, unless specifically allowed by an engineering evaluation that considers decay heat and hot leg pressurization. To avoid entering the 45 minute requirement, procedures will have the option of administratively limiting RCS Cold Leg vent size to less than one square inch until a Hot Leg vent is established.

Cold Leg valve openings will meet the same requirements as maintenance openings, or will be administratively controlled when such openings are greater than one square inch. Operation of the RCS Eductor System (to decrease activity and hydrogen levels) requires the opening of Cold Leg vent valves with an aggregate area of two to three square inches. If the evolution must be performed when the containment is not closed and a valid hot leg vent does not exist, then an operator will be continuously stationed inside the containment to close these valves within 20 minutes notice.

In addition, the Maintenance Department will signoff that the planned Containment Closure methods conform to the definition of a Closed Containment. Material such as wood and plastic sheeting will be specifically excluded from use as closure methods, unless specifically allowed by an engineering evaluation that considers the potential effects of containment internal pressurization and combustion.

(3) RCS Temperature

Provide two independent continuous indications of core exit temperature:

EXISTING ACTIONS:

While the plant is in Mode 5 or 6, water temperature leaving the RCS (Shutdown Cooling Heat Exchanger [SDC HX] Inlet) is monitored on recorders in the Control Room.

PLANNED ACTIONS:

Prior to entering a Reactor Coolant System Midloop Condition, two independent continuous temperature indications of Reactor Core exit conditions will be in operation. The selected indications will be the water covered unheated thermocouples of the Heated Junction Thermocouple (HJTC) System or the Core Exit Thermocouples addressed on the plant Qualified Safety Parameter Display System (QSPDS) Computer in the Control Room. For reliability, the selected indications will be energized from separate power supplies. When Reactor Head disassembly or reassembly is in progress, temporary cables will be provided to the selected thermocouples. The available temperature indications will be monitored and recorded hourly in the control room, until such instrumentation has been provided with alarm capability.

(4) RCS Water Level

Provide two independent continuous indications of RCS water level indication:

EXISTING ACTIONS:

Prior to draining the RCS below the Pressurizer, the Reactor Water Level Indication (RWLI) System is required to be in operation. This system provides wide range indication between the Pressurizer and the bottom of the Hot Leg and narrow range indication between the top and bottom of the Hot Leg. These indications are monitored and alarmed in the Control Room. In addition, this system has a permanently installed hard-piped sightglass which indicates between the Reactor Vessel Flange and seven inches below the centerline of the 42 inch Hot Leg. Since all of these indications connect to the same sensing taps, they are not considered independent.

Two secondary methods of level indication are used while the draining evolution is in progress. One method involves monitoring the uncover of HJTCs No. 3, 4, 5 and 6 using the QSPDS Computer. However, after the uncover of HJTC No. 6 (centerline of the Hot Leg) this indication is no longer useful because Low Pressure Safety Injection (LPSI) Pump vortexing will occur before reaching HJTC No. 7. The second method used involves calculating cumulative gallons drained and comparing this data to known RCS volumes.

LPSI Pump amperage provides an indirect secondary method of level indication as a backup to the RWLI. Since LPSI Pump amperage oscillations are a known precursor to major vortexing, amperage is frequently monitored in the Control Room.

PLANNED ACTIONS:

While in the mid loop condition, with HJTC No. 6 uncovered or inoperative, LPSI pump amperage will be monitored and recorded hourly in the control room, until such instrumentation has been provided with alarm capability.

Programmed Enhancements will include an evaluation for providing a second continuous indication of RCS water level.

(5) RCS Perturbation

Implement administrative control over RCS perturbations:

EXISTING ACTIONS:

Prior to draining the RCS below the top of the Hot Leg, threats to loss of RCS inventory are listed and updated by reviewing the daily revisions to the Work Authorization Letter. This provides a checklist of possible leakage paths should a loss of RCS inventory occur.

PLANNED ACTIONS:

Prior to entering an RCS Reduced Inventory Condition, RCS Perturbation control will be implemented. An initial RCS Perturbation List is established by reviewing "in progress" surveillances, procedures, and Work Authorizations to determine their potential threat to RCS stability. Additionally, 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.

Programmed Enhancements will include an evaluation to determine if it would be beneficial to tag the first isolation valve off the RCS/RHRS which could potentially drain the RCS to state that misoperation of this valve may result in a loss of RCS inventory.

(6) RCS Inventory Addition

Provide two available means of adding inventory to the Reactor Coolant System:

EXISTING ACTIONS:

Prior to and after draining the Reactor Coolant System, one High Pressure Safety Injection (HPSI) Pump is maintained available to inject water into one Hot Leg and two Cold Legs with associated flowpath valves operable from the Control Room.

PLANNED ACTIONS:

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 HPSI Pump operable and either a Containment Spray 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.

(7) Nozzle Dams

Implement controls over the installation and removal of Steam Generator Nozzle Dams:

EXISTING ACTIONS:

Prior to allowing the installation or removal of the steam generator nozzle dams, an RCS hot leg vent is established.

PLANNED ACTIONS:

Since the Existing Actions fully meet these requirements, no additional enhancements are planned in this area.

(8) Loop Stop Valves

Implement administrative controls over the closure of RCS Loop Isolation Valves:

This issue does not apply because plant design does not include loop isolation valves.