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 AUTH. NAME AUTHOR AFFILIATION
 MORGAN, H. E. Southern California Edison Co.
 RECIP. NAME RECIPIENT AFFILIATION
 KIRSCH, D. Region 5, Office of Director

SUBJECT: Informs that facility will commence Cycle 4 refueling outage prior to submittal of response to Generic Ltr 87-12. RCS will be drained to mid-loop for portion of outage & requests Tech Spec limitations applied to mid-loop operation.

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Southern California Edison Company

SAN ONOFRE NUCLEAR GENERATING STATION

P. O. BOX 128

SAN CLEMENTE, CALIFORNIA 92672

H. E. MORGAN
STATION MANAGER

TELEPHONE
(714) 368-6241

September 1, 1987

U. S. Nuclear Regulatory Commission
Region V
1450 Maria Lane, Suite 210
Walnut Creek, California 94596-5368

Attention: Mr. Dennis Kirsch,
Director, Division of Reactor Safety and Projects

Dear Sir:

Subject: Docket 50-361
Refueling Outage Plans
San Onofre Nuclear Generating Station Unit 2

Generic Letter 87-12, dated July 9, 1987, discusses issues related to operation of pressurized water reactors when the Reactor Coolant System (RCS) water level is below the top of the reactor vessel and requests all Licensees to respond to a number of questions related to this subject. SCE is in the process of developing a response to this letter and plans to provide that response to the NRC by the date requested.

In recognition of the fact that Unit 2 will commence its Cycle 4 refueling outage prior to this submittal, and that the RCS will be drained to mid-loop for a portion of the outage, SCE contacted the NRC Office of Nuclear Reactor Regulation to determine what restrictions, if any, in addition to current Technical Specification limitations, should be applied to mid-loop operation. Pending completion of our analyses in response to the Generic Letter and NRC review of that response, no additional restrictions were identified. Notwithstanding this, SCE has taken reasonable measures to improve our ability to operate safely during periods of mid-loop operation. A discussion of these measures is provided below for your information.

Operation with the RCS partially filled is required in order to remove and reinstall the reactor vessel head during refueling operations, to replace Reactor Coolant Pump (RCP) seals, to inspect steam generator tubes, as well as, to perform required maintenance on the RCS pressure boundary, valves or instruments connected thereto. Appropriate outage planning minimizes the duration of mid-loop operation by concurrently scheduling RCS pressure boundary activities to the maximum extent possible. During the current Unit 2 refueling outage, the RCS is scheduled to be in the partially filled condition (drained below the reactor vessel flange) approximately 210 hours for steam generator nozzle dam installation and preparation for core alterations and during a subsequent period of approximately 240 hours for RCS maintenance activities, and head installation.

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Initial draindown for reactor vessel head removal may not, by procedure, commence for at least 120 hours following reactor shutdown unless management approval is obtained. The decay heat generation rate at this time will have decreased significantly below that immediately following reactor shutdown.

In addition to a tygon tube manometer, wide range and narrow range level transmitters, permanently installed pressurizer level indication, as well as installed heated junction thermocouples will be available and utilized to provide for redundant RCS level monitoring during initial draindown, in the same manner as for the second draindown of the 1986 Unit 2 refueling (See Unit 2 LER 86-007). Following the initial draindown, the transmitters, as well as a gage glass, will be permanently installed utilizing stainless steel tubing with flexible metallic hose connections to the RCS. These indicators will then be available for RCS level monitoring in all subsequent draindowns. This Refueling Water Level Indication System (RWLIS) will provide local and remote (Control Room) indication of RCS water level, with adjustable alarm capability. Correlation of all level indications are conducted at several stages during draindowns, and continuation of draining will be permitted only when appropriate indicators agree within specified acceptance criteria.

During mid-loop operation, RCS level, as well as SDCS temperature, flow and pump discharge pressure, are monitored and trended. RCS temperature is maintained below 140F.

Based on analyses of a loss of shutdown cooling flow during mid-loop operations conducted to date, SCE has determined that localized core boiling could occur, under certain circumstances, within 10 minutes following the loss of SDCS flow. Such boiling will, however, provide for decay heat removal such that no fuel damage or degradation will occur provided the core is maintained covered with water. In addition to maintaining two trains of SDCS OPERABLE pursuant to Technical Specifications, SCE has modified its procedures to ensure that a HPSI pump, as well as an appropriate flow path to the RCS, is immediately available to provide make-up to the RCS from the RWST.

Analyses have shown that the core cooling rate during a loss of SDCS flow while at mid-loop is dependent upon the available vent paths for release of steam from the RCS to containment. SCE will establish RCS hot leg vent paths to containment (e.g., via pressurizer manway) to enhance core cooling in the event of a loss of SDCS flow.


Analyses have included consideration of the radiological consequences of the boiling of RCS water based on Dose Equivalent Iodine-131 (DEI-131) levels in the RCS prior to shutdown and have concluded that operation of the containment purge system may continue without exceeding regulatory limits for effluent release. With the containment purge system in operation, a negative pressure is established inside containment thereby minimizing the need for establishing containment closure. Nevertheless, SCE has in place administrative controls such that containment closure can be achieved within 4 hours of the loss of SDCS flow.

We are also implementing an additional program to prevent loss of SDCS flow. This program provides for special identification and control of work activities which could affect RCS level during mid-loop operation.

With these provisions in place, over and above those currently required by the Operating License, Technical Specifications or current NRC regulations, SCE believes the issues raised in the Generic Letter have been adequately addressed and measures have been implemented to improve our ability to operate safely with the RCS level at mid-loop. Accordingly, SCE plans to proceed with mid-loop operations as indicated above.

If you have any questions or require additional information, please contact me.

Sincerely,

A handwritten signature in dark ink, appearing to read "HEM" followed by a horizontal line.

cc: Mr. F. R. Huey, USNRC Sr. Resident Inspector SONGS