UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Application of SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. for a Class 103 License to Acquire, Possess, and Use a Utilization Facility as Part of Unit No. 2 of the San Onofre Nuclear Generating Station	)))))	Docket No. 50-361 Amendment Application No. 157

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10 CFR 50.90, hereby submit Amendment Application No. 157. This amendment application consists of Proposed Change Number NPF-10-458 to Facility Operating License No. NPF-10. Proposed Change Number NPF-10-458 is a request to change Technical Specification (TS) 3.9.4 "Shutdown Cooling (SDC) and Coolant Circulation -- High Water Level" and TS 3.9.5 "Shutdown Cooling (SDC) and Coolant Circulation -- Low Water Level." Proposed Change Number NPF-10-458 is a request to 1) reduce the water level in the reactor cavity during refueling outages when two loops of shutdown cooling (SDC) are required from 23 feet to 20 feet above the reactor pressure vessel flange, 2) increase the time a required loop of the SDC system may be removed from service from up to 1 hour per 8-hour period to up to 2 hours per 8-hour period, provided the upper guide structure has been removed from the reactor pressure vessel, 3) allow for running 1 loop of shutdown cooling with additional requirements when the water level is less than 20 feet but greater than 12 feet above the reactor pressure vessel flange, 4) add an action to be taken when operating 1 loop of SDC with less than 20 feet of water above the reactor pressure vessel flange when the specified requirements are not met, and 5) make editorial changes.

Subscribed on this 8th day of May, 1996.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

By: Dwight E. Nunn

Dwight E. Nunn

Vice President

State of California

County of San Diego

On 5/8/96 before me, Mariane Sanchez,

personally appeared Dwight E. Nunn, personally known to me to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Signature Mariane Sanchez

MARIANE SANCHEZ
COMM. # 1033763
Notary Public -- California
ORANGE COUNTY
My Comm. Expires OCT 14, 1998

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Application of SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. for a Class 103 License to Acquire, Possess, and Use a Utilization Facility as Part of Unit No. 3 of the San Onofre Nuclear Generating Station	)	Docket No. 50-362 Amendment Application No. 141

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10 CFR 50.90, hereby submit Amendment Application No. 141. This amendment application consists of Proposed Change Number NPF-15-458 to Facility Operating License No. NPF-15. Proposed Change Number NPF-15-458 is a request to change Technical Specification (TS) 3.9.4 "Shutdown Cooling (SDC) and Coolant Circulation -- High Water Level" and TS 3.9.5 "Shutdown Cooling (SDC) and Coolant Circulation -- Low Water Level." Proposed Change Number NPF-15-458 is a request to 1) reduce the water level in the reactor cavity during refueling outages when two loops of shutdown cooling (SDC) are required from 23 feet to 20 feet above the reactor pressure vessel flange, 2) increase the time a required loop of the SDC system may be removed from service from up to 1 hour per 8-hour period to up to 2 hours per 8-hour period, provided the upper guide structure has been removed from the reactor pressure vessel, 3) allow for running 1 loop of shutdown cooling with additional requirements when the water level is less than 20 feet but greater than 12 feet above the reactor pressure vessel flange, 4) add an action to be taken when operating 1 loop of SDC with less than 20 feet of water above the reactor pressure vessel flange when the specified requirements are not met, and 5) make editorial changes.

Subscribed on this 8th day of May, 1996.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

By: _____

Dwight E. Nunn

Vice President

State of California

County of San Diego

On 5/8/96 before me, Mariane Sanchez,

personally appeared Dwight E. Nunn, personally known to me to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Signature Mariane Sanchez

MARIANE SANCHEZ
COMM. # 1033763
Notary Public — California
ORANGE COUNTY
My Comm. Expires OCT 14, 1998

Enclosure

DESCRIPTION AND SAFETY ANALYSIS
OF PROPOSED CHANGE NPF-10/15-458

Proposed Change Number 458 (PCN-458) is a request to revise the Unit 2 Amendment No. 127 and Unit 3 Amendment No. 116 approved Technical Specification (TS) 3.9.4 "Shutdown Cooling (SDC) and Coolant Circulation -- High Water Level" and TS 3.9.5 "Shutdown Cooling (SDC) and Coolant Circulation -- Low Water Level."

Existing Specifications:

Unit 2: See Attachment "A"
Unit 3: See Attachment "B"

Revised Specifications:

Unit 2: See Attachment "C"
Unit 3: See Attachment "D"

SUMMARY of CHANGE

By a letter dated February 15, 1995, the NRC issued Amendment Nos. 116 and 105 to Facility Operating License Nos. NPF-10 and NPF-15 for the San Onofre Nuclear Generating Station Units 2 and 3, respectively. These amendments were issued for use in the Cycle 8 refueling outages only in response to amendment applications consisting of PCN 402. PCN 458 is similar to PCN 402, however, PCN 458 requests a permanent change to the technical specifications.

PCN 458 is a request to:

1) Reduce the water level in the reactor cavity during refueling outages when two loops of shutdown cooling (SDC) are required from 23 feet to 20 feet above the reactor vessel flange,

2) Increase the time a required loop of the SDC system may be removed from service from up to 1 hour per 8-hour period to up to 2 hours per 8-hour period, provided the upper guide structure has been removed from the reactor vessel,

3) Allow for running only 1 loop of shutdown cooling with additional requirements when the water level is less than 20 feet but greater than or equal to 12 feet above the reactor vessel flange,

4) Add an action to be taken when operating only 1 loop of SDC with less than 20 feet of water above the reactor vessel flange when the specified requirements are not met.

5) Make editorial changes.

These changes will allow the required maintenance and testing to be scheduled and performed in a cost effective way, and they will potentially save Southern California Edison (Edison), et al., between 14 and 48 hours of critical path time in future refueling outages for each Unit.

The LCO section of the Bases B 3.9.4 states that only one SDC loop is required for decay heat removal in MODE 6, with water level ≥ 23 feet above the top of the reactor vessel flange. Only one SDC loop is required because the column of water above the reactor vessel flange provides backup decay heat removal capability. The Applicability section states that the 23 foot level was selected because it corresponds to the 23 foot requirement established for fuel movement in LCO 3.9.6.

Edison has performed calculations to determine the time it would take for the water to boil with an initial water level of 23 feet above the flange, 13 feet above the flange, and 1 foot below the flange. Attachment E is a figure of the heatup curves from the calculation. Additional components are required to be available by this PCN when the reactor cavity water level is 12 feet above the reactor vessel flange to be able to raise the water level to 20 feet above the reactor vessel flange in the event of a loss of SDC. Also, with the reactor cavity flooded to any level above the reactor vessel flange, Edison has demonstrated that containment closure can be achieved within 1 hour, even in the event of a loss of offsite power.

Edison has performed a Probabilistic Risk Assessment (PRA), with a) one loop of the SDC system operable with the reactor cavity water level greater than or equal to 12 feet above the reactor vessel flange, and b) one loop of the SDC system operable with the reactor cavity water level greater than or equal to 20 feet above the reactor vessel flange, to show that operating the plant within the conditions allowed by the proposed TS does not significantly increase the probabilities of inventory boiling and core damage.

Items 1 and 2 provide a permanent solution to a testing requirement originally addressed by a temporary waiver of compliance from the pre Unit 2 Amendment No. 127 approved TSs 3.9.8.1 and 3.9.8.2. This temporary waiver was approved by a letter from R. P. Zimmerman (NRC) to R. W. Krieger (Edison) dated October 10, 1991. The request to change the water level from 23 feet to 20 feet above the reactor vessel flange and allow the SDC system to be removed from service for testing of Low Pressure Safety Injection system components is supported by recent calculations. Additionally, specific requirements are being added to permit increasing the time the required loop of SDC may be removed from service. These changes permit the required testing to be performed without offloading any fuel from the reactor vessel.

Additionally, to support the inservice testing of the Low Pressure Safety Injection (LPSI) system components and integrate the testing in the outage plan, item 2 proposes to increase the time a required loop of the SDC system may be removed from service from up to 1 hour per 8-hour period to up to 2 hours per 8-hour period. This inservice valve testing will add cool water to the reactor cavity at a flow rate between 5000 gpm and 5300 gpm. Typically, each pump will run from 1 to 5 minutes during the test and will increase the reactor cavity water level by 4 to 20 inches. The Refueling

Water Storage Tank (RWST) boron concentration in conjunction with the flowrate provided by the SDC pumps operating for 6 hours out of 8 will provide sufficient mixing to prevent boron stratification. The two hours allows the valve lineups and inservice testing to be performed without unnecessary urgency. A restriction is being added to prevent removing both SDC loops from service unless the upper guide structure has been removed from the reactor vessel which assures that natural circulation heat transfer is not impeded.

Also, by lowering the required water level from 23 feet to 20 feet above the reactor vessel flange, maintenance on one SDC loop and its supporting equipment can be scheduled in conjunction with some reactor internals removal preparation work. This will save approximately 14 hours of critical path time.

Items 3 and 4 will support additional flexibility in scheduling maintenance outages for the SDC loops and their supporting systems. To support the PRA for having 1 loop of SDC operable when the water is less than 20 feet above the reactor vessel flange and greater than or equal to 12 feet above the reactor vessel flange, Edison has established 8 requirements to be met and added a new action statement.

Item 5 adds wording to the notes in LCOs 3.9.4 and 3.9.5 that was unintentionally deleted by the Unit 2 Amendment No. 127 and Unit 3 Amendment No. 116 approved Technical Specifications.

DESCRIPTION of CHANGE

PROPOSED TECHNICAL SPECIFICATION CHANGES

The proposed change to the TS 3.9.4 first note under the Limiting Condition for Operation (LCO) and the Applicability statement for both the Unit 2 and Unit 3 TSs follows (highlighting for additions and line out for deletions):

NOTES

1. With the upper guide structure removed from the reactor vessel the required SDC loop may be removed from operation for ≤ ~~1~~ 2 hours per 8-hour period, provided: ~~no operations are permitted that would cause dilution of the Reactor Coolant System boron concentration.~~

   a. The maximum RCS temperature is maintained ≤ 140°F.

   b. No operations are permitted that would cause a reduction of the RCS boron concentration.

   c. The capability to close the containment penetrations with direct access to the outside atmosphere within the calculated time to boil is maintained.

   d. The reactor cavity water level is maintained ≥ 20 feet above the top of the reactor pressure vessel flange, or, for core alterations, ≥ 23 feet above the top of the reactor pressure vessel flange.

2. A containment spray pump may be used in place of a low pressure safety injection pump in either or both shutdown cooling loops to provide shutdown cooling flow.

"APPLICABILITY: MODE 6 with the water level ≥ ~~23~~ 20 ft above the top of the reactor vessel flange.

The proposed change to TS 3.9.5 will revise the LCO, the Applicability statement, and the Action Statement for both the Unit 2 and Unit 3 TSs, as follows:

LIMITING CONDITION FOR OPERATION

LCO 3.9.5 Two SDC Loops shall be OPERABLE and one SDC loop shall be in operation.

NOTE

A containment spray pump may be used in place of a low pressure safety injection pump in either or both shutdown cooling loops to provide shutdown cooling flow.

or

One loop of shutdown cooling shall be OPERABLE and operating under the following conditions:

1) The reactor has been shutdown for at least 6 days.

2) The water level above the reactor vessel flange is 12 feet or greater.

3) The associated loop of Salt Water Cooling (SWC) is OPERABLE and operating.

4) The associated Component Cooling Water (CCW) pump and the CCW swing pump are OPERABLE, and the associated CCW loop is OPERABLE and operating.

5) The Shutdown Cooling system is operating using the containment spray pump, and the associated high pressure safety injection pump and the low pressure safety injection pump are OPERABLE and at ambient temperature, available for injection from the RWST.

6) The RWST contains the volume of water required to raise the level to 20 feet above the reactor vessel flange.

7) The associated Emergency Diesel Generator is OPERABLE.

8) The water temperature of the SDC system is maintained less than 120°F.

APPLICABILITY: MODE 6 when the water level above the top of the reactor vessel flange is less than ~~23~~ 20 feet.

ACTIONS:

A statement is being added to Action "A" that will limit the applicability of Action "A" to initial conditions of two shutdown cooling loops OPERABLE

A new Action "B" is being added for the conditions when only one SDC loop is OPERABLE and the Reactor Cavity water level is less than 20 feet above the reactor vessel flange. This new Action statement will require immediate action to establish greater than or equal to 20 feet of water above the reactor vessel flange if any of the required conditions (1 through 8) are not met.

The current Action "B" will become Action "C."

The revised Bases B 3.9.4 and B 3.9.5 are included as Attachment F for your information.

SYSTEM DESCRIPTIONS

The purpose of the Emergency Core Cooling System (ECCS) is to inject borated water into the Reactor Coolant System (RCS) to cool the core following a Loss of Coolant Accident (LOCA) and to maintain the reactor subcritical following a LOCA or a Main Steam Line Break (MSLB).

The ECCS system includes three High Pressure Safety Injection (HPSI) pumps, two Low Pressure Safety Injection (LPSI) pumps, and two Containment Spray (CS) pumps. These pumps are in two redundant and independent loops. The third HPSI pump is a swing pump which can be aligned to either loop.

The two LPSI pumps also provide SDC flow through the reactor core and the SDC system heat exchangers for shutdown plant cooling or for long term cooling for small break loss of cooling accident scenarios. Also, as the result of a recent design change, the containment spray pumps may be aligned to be used in place of a LPSI pump in either or both shutdown cooling loops to provide shutdown cooling flow.

BACKGROUND

Limiting Conditions for Operation (LCO) in TSs 3.9.4 and 3.9.5 define the operability requirements for the SDC system during refueling operations (Mode 6) while the water level above the top of the reactor vessel flange in the reactor cavity is at least 23 feet and less than 23 feet, respectively. The objective of these TSs is to ensure that 1) sufficient cooling is available to remove decay heat, 2) the water in the reactor vessel is maintained below 140°F, and 3) sufficient coolant circulation is maintained in the reactor core to minimize boron stratification leading to a boron dilution incident.

Prior to the approval of Unit 2 Amendment No. 127 and Unit 3 Amendment No. 116, Technical Specification Bases Section 3/4.9.8 has stated that "With the reactor vessel head removed and 23 feet of water above the reactor vessel flange, a large heat sink is available for core cooling, thus in the event of a failure of the operating shutdown cooling loop, adequate time is provided to initiate emergency procedures to cool the core."

In the Bases for the New Standard Technical Specifications, NUREG 1432, Revision 0, dated September 30, 1992, Section B 3.9.4 it is stated that; "The 23 ft level was selected because it corresponds to the 23 ft requirement established for fuel movement in LCO 3.9.6, "Refueling Water Level."

Edison Calculation N-0220-029 was performed to address action items identified in an Edison assessment of NUMARC 91-06 "Guidelines for Industry Actions to Assess Shutdown Management," December, 1992. Calculation N-0220-029 provides time to boil and time to uncover the core curves based on several plant conditions over a 90-day period following reactor shutdown. These plant conditions include various water levels (from 17 inches above the bottom of the hot leg to 23 feet above the reactor vessel flange, Steam Generator (SG) tubes empty and full, and SG nozzle dams installed and not installed). The results of this calculation are used to determine containment closure requirements for the various Mode 5 and Mode 6 configurations. These curves are used by the outage planning team to plan refueling outages with "Defense in Depth."

The primary consideration in planning outages at San Onofre is safety. "Defense in Depth," based on NUMARC 91-06, is the concept used in outage planning to ensure sufficient equipment, including instrumentation, is maintained available to provide both a primary and an alternate or backup method for control of each of the Shutdown Safety Functions. Operations verifies each day during an outage that this equipment set is available as planned.

Defense in Depth planning includes:

- Providing systems, structures, and components to ensure backup of Shutdown Safety Functions using redundant, alternate, or diverse methods;

- Planning and scheduling outage activities to optimize safety system availability;

- Providing administrative controls that support and/or supplement the above elements.

The Edison Nuclear Safety Group performs a comprehensive outage safety assessment based upon an expanded version of our Individual Plant Examination (IPE) for each refueling outage. The purpose of this assessment is to evaluate the probability of either fuel damage or inventory heatup during the various plant configurations throughout the outage, including reduced inventory operations, fuel transfer operations, Spent Fuel Pool operations during full core offload, and midloop operations with the reactor fueled. If

the results of the outage safety assessment indicate a higher probabilistic risk than is desired, compensatory measures are implemented or plans are changed to reduce the risk to acceptable levels. The results of these evaluations have led to plant configuration changes or outage sequence changes in the last several refueling outages, which yielded significant gains in shutdown safety.

DISCUSSION

General

The proposed savings identified which initiated this request for a TS change were made possible, in part, due to the recent SDC design change which allows the SDC system to be cross-tied with the containment spray system (Edison Projects 2-6863 and 3-6863). The NRC approved the cross tie design change by License Amendments 106 and 95 for Units 2 and 3, respectively. Now that this capability exists, cost savings due to reduced outage times are possible. The reduction of the required water level from 23 feet to 20 feet will potentially save approximately 14 hours of outage time. The additional change requiring only 1 loop of SDC operable with the water level 12 feet or greater above the reactor vessel flange will save approximately another 34 hours of outage time. The expected savings associated with PCN-458 is between 14 and 48 hours of outage time during future refueling outages at each unit.

Probability Risk Assessments (PRAs) were performed to assess the risks of inventory boiling and core damage with using the proposed technical specification change for operating with the water level at 12 feet above the vessel flange or greater. The risks of inventory boiling and core damage were calculated to increase by 1.5×10^{-5} per day and 6×10^{-9} per day, respectively, from the current TS requirements.

The proposed TS changes in this PCN are requested to reduce outage durations. The required water level to move fuel will still remain 23 feet above the reactor vessel flange as specified in TS 3.9.10. Our intent will always be to operate in a safe condition and plan according to a Defense in Depth philosophy. Prior to each outage the Defense in Depth philosophy is used to plan the work required during an outage. The required Mode 5 and Mode 6 configurations are compared to the assumptions in Calculation N-0220-029 and evaluated to ensure plant safety margins are maintained. Therefore, utilizing the calculations and the Defense in Depth philosophy in outage planning, plant safety is maintained throughout all evolutions of the refueling outage.

Proposed Changes: Items 1 and 2

The request to lower the required water level from 23 feet above the reactor vessel flange to 20 feet above the reactor vessel flange and to increase the time the SDC system is allowed to be out of service from "≤ 1 hour per 8-hour period" to "≤ 2 hours per 8-hour period" is necessary to allow for the addition of water to the reactor cavity and for adequate time to set up and perform testing of LPSI system components (e.g., Inservice Testing of the LPSI pump suction check valves).

This change will allow this test to be performed in conjunction with the normal reactor cavity fill evolutions during a refueling outage without requiring the core to be offloaded from the reactor vessel. Specifically stating that the upper guide structure will be removed assures that natural heat transfer is not impeded. This requirement was requested by the NRC during the review of PCN 402.

This change allows the SDC system alignments to be made and the tests to be completed as part of an integrated outage plan. The time the SDC system is allowed to be secured is increased to 2 hours, but during the short test the water level is being increased by approximately 4 to 20 inches with a high flow rate of cool borated water from the RWST. The 6-hour period following the test that the SDC system would be required to run is adequate to provide mixing and prevent boron stratification. The 2-hour period will allow the required valve lineup changes and the test to be performed without unnecessary urgency.

The reduction in the required water level from 23 feet to 20 feet above the reactor vessel flange will also allow one loop of SDC and the supporting loops of Component Cooling Water (CCW) and Salt Water Cooling (SWC) to be removed from service and still allow some reactor internals removal preparations to be performed. Currently, the loop outages would have to be delayed approximately 14 hours to allow the reactor internals removal preparations to reach the point when the reactor cavity can be filled to 23 feet above the reactor vessel flange.

The reduction of water from 23 feet above the reactor vessel flange to 20 feet above the reactor vessel flange is a small change and has little impact on the time to boil (4.0 hours to 3.5 hours at six days following the reactor shutdown). The basis of having a sufficient heat sink to provide core cooling and allow time to take other actions to cool the core in the event of losing the operating loop of SDC is still maintained.

To assure the objectives of TS 3.9.4 are satisfied during performance of the testing of LPSI system components the following requirements will be met:

1) The periods in which a SDC loop is not in operation will be limited to $\leq$ 2 hours per 8-hour period, provided the upper guide structure has been removed from the reactor vessel,

2) The maximum RCS temperature will be maintained $\leq$ 140°F.

3) No operations will be permitted that would cause a reduction of the RCS boron concentration.

4) The capability to close the containment penetrations with direct access to the outside atmosphere within the calculated time to boil will be maintained.

5) The reactor cavity water level will be maintained greater than or equal to 20 feet above the reactor vessel flange.

With no SDC system operating the above described compensatory measures provide assurance that performance of the full flow LPSI pump suction header check valve test is of no safety consequence.

The maximum RCS temperature is maintained ≤ 140°F. The two hours is sufficient time to align the system to test, perform the test, and restore the loop of SDC to operation prior to exceeding 140°F. The initial conditions and heatup rate are selected such that RCS temperature remains ≤ 140°F during the test. Typically, the reactor cavity water initial temperature will be less than 100°F. In the request for the October 10, 1991, waiver of compliance, the increase in the RCS temperature without SDC in operation due to decay heat was estimated to be a maximum of 2.6°F per hour. During the Unit 2 tests the SDC system was secured twice, once for 18 minutes and once for 15 minutes. During the test, cool borated water from the RWST was introduced to the RCS and resulted in an increased inventory, effectively providing a source of core cooling. The flow rate during this test was between 5000 gpm and 5300 gpm. The reactor cavity water level increased one inch for every 1260 gallons of water added, a rate of 4.2 inches per minute.

No operations are permitted that would cause a reduction of the RCS boron concentration. This minimizes the probability of an inadvertent boron dilution event. Boron stratification due to temperature gradients will not develop to any significant extent during the time when no loop of SDC is in operation. The use of adequately borated water for injection into the RCS during the test provides assurance that the test itself cannot lead to a boron dilution event. When the SDC system is operating, the minimum SDC flow rate of 2200 gpm imposed by Surveillance Requirements SR 3.9.4.1 and SR 3.9.5.2 is sufficient to ensure complete mixing of the boron within the RCS.

The capability to close the containment penetrations with direct access to the outside atmosphere within the calculated time to boil is maintained. During outages the Operations Department has updated information based on current calculations which show the time to boil. Provisions are maintained in place to ensure containment closure can be established within the calculated time frame. With the reactor cavity flooded to any level above the reactor vessel flange, Edison has demonstrated that containment closure can be achieved within 1 hour, even in the event of a loss of offsite power. It will take approximately 6 days to reach the point in the outage where the reactor head is removed and the cavity is filled with water. The time to boil with initial conditions of 6 days following shutdown and 20 feet of water above the reactor vessel flange is approximately 3.5 hours. The time to uncover the core with these same initial conditions is approximately 77.5 hours.

The reactor cavity water level is maintained greater than or equal to 20 feet above the reactor vessel flange. This level ensures an adequate heat sink and allows room to perform the LPSI pump suction header check valve test, which will increase this water level.

Proposed Changes: Items 3 and 4

Based on Calculation N-0220-029, with the reactor cavity water level at 12 feet above the flange, at 6 days after shutdown it takes approximately

2.3 hours to boil and 48 hours to uncover the core, the top of the active fuel. With the reactor cavity flooded to any level above the reactor vessel flange, Edison has demonstrated that containment closure can be achieved within 1 hour, even in the absence of offsite power. This will provide a minimum of a 1.3-hour margin. Therefore, a restriction of 6 days after shutdown is added to the TS.

Using the LPSI pump as the standby pump, cold RWST injection water can fill the reactor cavity at a flow rate of approximately 5000 gpm, over twice the required SDC flow of 2200 gpm. It will take approximately 30 minutes to align a LPSI pump to fill the cavity and approximately 25 minutes to raise the reactor cavity level from 12 feet above the reactor vessel flange to 20 feet above the reactor vessel flange, for a total time of approximately 55 minutes.

The allowance to operate with only one loop of SDC OPERABLE and operating with the reactor cavity water level less than 20 feet above the reactor vessel flange but greater than or equal to 12 feet above the reactor vessel flange will provide for a significant savings in outage time. The provisions added by this TS change ensure there is adequate time to take action and provide a method to restore the reactor cavity water level to 20 feet above the reactor vessel flange, taking the plant to a condition bounded by TS 3.9.4. Specifically, these provisions will:

1. Require the reactor to be shutdown for at least 6 days to ensure that the time to boil is greater than twice the time it would take to establish containment closure, and significantly more time than it would take to commence reactor cavity fill with the required standby equipment. Limiting initiation of this proposed configuration to at least 6 days following reactor shutdown allows the decay heat to be naturally reduced which increases the time to boil. Furthermore, the time to boil and time to uncover the core both increase each subsequent day following reactor shutdown.

2. Limit the water level above the reactor vessel flange to 12 feet or greater, providing enough cooling to allow time for corrective actions. Although the 12 feet will be our absolute limit, typically, we operate with some margin away from the limits. To perform the outage work supported by this change (i.e., SDC, CCW, and SWC loop outages running concurrent with reactor internals disassembly and reassembly) we need a water level less than 12'9" above the reactor vessel flange. Typically, we will maintain a level closer to the 12'9" than the 12' above the flange. The reactor pressure vessel flange is approximately 11' above the top of the fuel. Therefore, the water level will be a minimum of 23' above the fuel, which still maintains a large volume of water to provide a heat sink.

3. Require one loop of SWC and CCW operable, and the CCW swing pump maintained operable to reduce the probability of CCW failure.

4. Require one loop of Shutdown Cooling to operate using the containment spray pump. Also, require the LPSI pump to be the main standby pump ready to fill the cavity to at least 20 feet above the reactor vessel

flange. In the event that CCW is lost, cooling flow to all ECCS pumps is also lost. The LPSI pump can start cold and raise the reactor cavity water level from 12 feet above the reactor vessel flange to 20 feet above the reactor vessel flange within the manufacturer's recommended operating times without CCW flow. The high pressure safety injection pump will also be maintained as a standby pump ready to increase the water level if needed. In support of this contingency the RWST will be required to contain the volume of water required to raise the level to 20 feet above the reactor vessel flange.

5. Require the water temperature of the SDC system to be maintained less than 120°F. This is the temperature the time to boil curves are based on. However, the normal operating temperature during this condition will typically be less than 100°F.

6. Provided that only one loop of the shutdown cooling system is operable with less than 20 feet of water above the reactor vessel flange and any of the required conditions are not met, action will be taken to immediately establish greater than or equal to 20 feet of water above the reactor vessel flange. By taking action to restore the level to 20 feet above the reactor vessel flange the plant will be placed in TS 3.9.4, which only requires one loop of SDC to be operable. Additionally, the core will not heat up while the reactor cavity water level is being raised with cool water from the RWST. This will provide additional time to either restore the one loop of SDC or take other actions to provide core cooling as required by TS 3.9.4.

Proposed Change Items 5:

This change adds wording to the notes in LCOs 3.9.4 and 3.9.5 that was unintentionally deleted by the Unit 2 Amendment No. 127 and Unit 3 Amendment No. 116 approved Technical Specifications. When the Unit 2 Amendment No. 127 and Unit 3 Amendment No. 116 TSs are implemented (scheduled for July of 1996), the following note will read:

> "A containment spray pump may be used in place of a low pressure safety injection pump to provide shutdown cooling flow."

PCN 458 restores the phrase "in either or both shutdown cooling loops," which was inadvertently omitted by Unit 2 Amendment No. 127 and Unit 3 Amendment No. 116. Therefore, this is an editorial change.

SAFETY ANALYSIS

The proposed change described above shall be deemed to involve a significant hazards consideration if there is a positive finding in any one of the following areas:

1. Will operation of the facility in accordance with this proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   Limiting Conditions for Operation (LCO) in Technical Specifications (TSs) 3.9.4 and 3.9.5 define the operability requirements for the Shutdown Cooling (SDC) system during refueling operations (Mode 6) while the water level above the top of the reactor vessel flange is at least 23 feet and less than 23 feet, respectively. The objective of these TSs is to ensure that 1) sufficient cooling is available to remove decay heat, 2) the water in the reactor vessel is maintained below 140°F, and 3) sufficient coolant circulation is maintained in the reactor core to minimize boron stratification leading to a boron dilution incident.

   The proposed TS changes affect the current limits imposed while ensuring adherence to the bases of the TS. No plant modifications are being made. The reactor cavity water level limitations and SDC system required operating times are being changed based on plant specific calculations and the objectives of the TSs are being maintained.

   1) Reduce the water level where two loops of SDC are required from 23 feet to 20 feet above the reactor vessel flange.

   Prior to the approval of Unit 2 Amendment No. 127 and Unit 3 Amendment No. 116, Technical Specification Bases Section 3/4.9.8 has stated that "With the reactor vessel head removed and 23 feet of water above the reactor vessel flange, a large heat sink is available for core cooling, thus in the event of a failure of the operating shutdown cooling loop, adequate time is provided to initiate emergency procedures to cool the core."

   In the Bases for the New Standard Technical Specifications, "NUREG 1432, Revision 0, dated September 30, 1992, Section B 3.9.4 it is stated that; "The 23 ft level was selected because it corresponds to the 23 ft requirement established for fuel movement in LCO 3.9.6, "Refueling Water Level."

   Southern California Edison (Edison) calculations show that there is an insignificant difference in the time to boil due to the 3-foot change in required water level. Therefore, adequate water is still available to mitigate the consequences of losing SDC.

2) Increase the time a required loop of the SDC system may be removed from service from up to 1 hour per 8-hour period to up to 2 hours per 8-hour period, provided the upper guide structure has been removed from the reactor vessel,

The proposed TS changes the time the SDC loop may be removed from operation from up to 1 hour per 8-hour period to up to 2 hours per 8-hour period, and allows removal of the SDC loop from operation for testing of the Low Pressure Safety Injection (LPSI) system components as well as for core alterations in the vicinity of the hot legs. The proposed TS change also imposes certain restrictions to ensure operating the SDC system in accordance with this proposed TS change is of no safety significance. These estrictions are discussed separately below.

Specifically stating that the upper guide structure will be removed assures that natural heat transfer is not impeded.

When securing the only operating loop of the SDC system the maximum Reactor Coolant System (RCS) temperature is maintained $\leq$ 140°F. The initial conditions and heatup rate are selected such that the RCS temperature remains $\leq$ 140°F during the test. Therefore, there is ample margin to boiling. Typical initial temperatures are less than 100°F.

The water being injected by the LPSI system test is cool water from the Refueling Water Storage Tank (RWST) and will increase the reactor cavity water level by several inches, providing more cool water to the heat sink. The two hours is sufficient time to align the system to test, perform the test, and restore the loop of SDC to operation prior to exceeding 140°F.

No operations are permitted that would cause a reduction of the RCS boron concentration. This minimizes the probability of an inadvertent boron dilution event. The use of adequately borated water for injection into the RCS during the test provides assurance that the test itself cannot lead to a boron dilution event. When the SDC system is operating, the minimum SDC flow rate of 2200 gpm imposed by Surveillance Requirements SR 3.9.4.1 and SR 3.9.5.1 is sufficient to ensure complete mixing of the boron within the RCS.

Securing SDC flow is only allowed when the reactor cavity water level is maintained greater than or equal to 20 feet above the reactor vessel flange. This level ensures an adequate heat sink to perform the LPSI pump suction header check valve test.

3) Allow for running 1 loop of shutdown cooling with additional requirements when the water level is less than 20 feet but greater than or equal to 12 feet above the reactor vessel flange,

4) Add an action to be taken when operating 1 loop of SDC with less than 20 feet of water above the reactor vessel flange when the specified requirements are not met.

In the event of a loss of SDC the time to boil is reduced from approximately 4.0 hours when the water level is 23 feet above the reactor vessel flange to approximately 2.3 hours at 12 feet, assuming the reactor has only been shutdown for 6 days. However, this is ample time to close containment (less than 1 hour) and to restore SDC or initiate alternative cooling (e.g., add water to the cavity (approximately 1 hour)). The reactor pressure vessel flange is approximately 11' above the top of the fuel. Therefore, the water level will be a minimum of 23' above the fuel, which still maintains a large volume of water to provide a heat sink.

Requiring the reactor to be shutdown for at least 6 days to have only one loop of SDC operable when the reactor cavity level is between 20 feet and 12 feet above the reactor vessel flange ensures that the time to boil is greater than twice the time it would take to establish containment closure and to commence reactor cavity fill with the required standby equipment.

One loop of SDC operating with a containment spray pump allows for the high capacity LPSI pump to be the main standby pump capable of filling the reactor cavity to at least 20 feet above the reactor pressure vessel flange in the event SDC is lost. The high pressure safety injection pump will also be maintained OPERABLE to increase the water level if needed. In support of this contingency the RWST will be required to contain the volume of water needed to raised the level to 20 feet above the reactor pressure vessel flange. As discussed above, the reactor cavity can be filled at a rate of approximately 4.0 inches per minute with the LPSI pump.

If operating one loop of the SDC system with less than 20 feet of water above the reactor vessel flange and any of the required conditions are not met, requiring immediate action to establish greater than or equal to 20 feet of water above the reactor vessel flange ensures no time is wasted trying to restore the required condition not met. By taking action to restore the level to 20 feet above the reactor vessel flange the plant will be placed in TS 3.9.4, which only requires one loop of SDC to be operable. Additionally, the core will not heat up while the water level in the reactor cavity is being raised with cool water from the RWST. This will provide additional time to either restore the one loop of SDC or take other actions to provide core cooling as required by TS 3.9.4.

A Probabilistic Risk Assessment (PRA), with a) one loop of the SDC system operable with the reactor cavity water level greater than or equal to 12 feet above the reactor vessel flange, and b) one loop of the SDC system operable with the reactor cavity water

level greater than or equal to 20 feet above the reactor vessel flange, showed that the operations in accordance with the proposed TS would not significantly increase the probabilities of inventory boiling and core damage.

5) Item 6 adds wording to the notes in LCOs 3.9.4 and 3.9.5 that was unintentionally deleted by the Unit 2 Amendment No. 127 and Unit 3 Amendment No. 116.

This is an editorial change.

Therefore, proposed changes 1 through 5 do not involve a significant increase in the probability or consequences of an accident.

2. Will operation of the facility in accordance with this proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

1) Reduce the water level where two loops of SDC are required from 23 feet to 20 feet above the reactor vessel flange,

2) Increase the time a required loop of the SDC system may be removed from service from up to 1 hour per 8-hour period to up to 2 hours per 8-hour period, provided the upper guide structure has been removed from the reactor vessel,

3) Allow for running 1 loop of shutdown cooling with additional requirements when the water level is less than 20 feet but greater than or equal to 12 feet above the reactor vessel flange,

4) Add an action to be taken when operating 1 loop of SDC with less than 20 feet of water above the reactor vessel flange when the specified requirements are not met,

The Limiting Conditions for Operation (LCO) in Technical Specifications (TSs) 3.9.4 and 3.9.5 define the operability requirements for the SDC system during refueling operations (Mode 6) while the water level above the top of the reactor vessel flange is at least 23 feet and less than 23 feet, respectively. The objective of the proposed TS changes is to ensure that the intent of the Bases is maintained. [i.e., 1) sufficient cooling is available to remove decay heat, 2) water in the reactor vessel is maintained below 140°F, and 3) sufficient coolant circulation is maintained in the reactor core to minimize boron stratification leading to a boron dilution incident.]

The proposed TS changes affect the current limits imposed while ensuring adherence to the bases of the TS. No plant modifications are being made. The reactor cavity water level limitations and SDC system required operating times are being changed based on plant specific calculations, and the objective of the TSs are being maintained. The added requirements and action statement facilitate safe operation.

5) Item 6 adds wording to the notes in LCOs 3.9.4 and 3.9.5 that was unintentionally deleted by the Unit 2 Amendment No. 127 and Unit 3 Amendment No. 116.

This is an editorial change.

Therefore, the operation of the facility in accordance with proposed changes 1 through 5 does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Will operation of the facility in accordance with this proposed change involve a significant reduction in a margin of safety?

Response: No

Limiting Conditions for Operation (LCO) in TSs 3.9.4 and 3.9.5 define the operability requirements for the SDC system during refueling operations (Mode 6) while the water level above the top of the reactor vessel flange is at least 23 feet and less than 23 feet, respectively. The objectives of these TSs are to ensure that 1) sufficient cooling is available to remove decay heat, 2) the water in the reactor vessel is maintained below 140°F, and 3) sufficient coolant circulation is maintained in the reactor core to minimize boron stratification leading to a boron dilution incident.

1) Reduce the water level where two loops of SDC are required from 23 feet to 20 feet above the reactor vessel flange.

Prior to the approval of Unit 2 Amendment No. 127 and Unit 3 Amendment No. 116, Technical Specification Bases Section 3/4.9.8 has stated that "With the reactor vessel head removed and 23 feet of water above the reactor vessel flange, a large heat sink is available for core cooling, thus in the event of a failure of the operating shutdown cooling loop, adequate time is provided to initiate emergency procedures to cool the core."

In the Bases for the New Standard Technical Specifications, NUREG 1432, Revision 0, dated September 30, 1992, Section B 3.9.4 it is stated that "The 23 ft level was selected because it corresponds to the 23 ft requirement established for fuel movement in LCO 3.9.6, "Refueling Water Level."

Edison calculations show that there is a minimal difference in the time to boil due to the 3-foot change in required water level. Therefore, the margin of safety has not been significantly reduced.

2) Increase the time a required loop of the SDC system may be removed from service from up to 1 hour per 8-hour period to up to 2 hours per 8-hour period, provided the upper guide structure has been removed from the reactor vessel.

The proposed TS changes the time the SDC loop may be removed from operation from up to 1 hour per 8-hour period to up to 2 hours per 8-hour period, and allows removal of the SDC loop from operation for testing of the LPSI system components as well as for core alterations in the vicinity of the hot legs. The proposed TS change also imposes certain restrictions to ensure operating the SDC system in accordance with this proposed TS change is of no safety significance. These restrictions are discussed separately below.

Specifically stating that the upper guide structure will be removed assures that natural heat transfer is not impeded.

When securing the only operating loop of the SDC system, the maximum RCS temperature is maintained $\leq$ 140°F. The initial conditions and heatup rate are selected such that RCS temperature remains $\leq$ 140°F during the test. Therefore, there is ample margin to boiling. Typical initial temperatures are less than 100°F.

The water being injected by the LPSI system test is cool borated water from the RWST and will increase the level of the reactor cavity by several inches. The two hours is sufficient time to align the system to test, perform the test, and restore the loop of SDC to operation prior to exceeding 140°F.

No operations are permitted that would cause a reduction of the RCS boron concentration. This minimizes the probability of an inadvertent boron dilution event. The use of adequately borated water for injection into the RCS during the test provides assurance that the test itself cannot lead to a boron dilution event. When the SDC system is operating, the minimum SDC flow rate of 2200 gpm is sufficient to ensure complete mixing of the boron within the RCS.

Securing SDC flow is only allowed when the reactor cavity water level is maintained greater than or equal to 20 feet above the reactor vessel flange. This level ensures an adequate heat sink to perform the LPSI pump suction header check valve test.

The added requirements and the nature of the test provide assurances that the water temperature will be maintained less than 140°F and that boron stratification is prevented.

3) Allow for running 1 loop of shutdown cooling with additional requirements when the water level is less than 20 feet but greater than or equal to 12 feet above the reactor vessel flange.

4) Add an action to be taken when operating 1 loop of SDC with less than 20 feet of water above the reactor vessel flange when the specified requirements are not met.

In the event of a loss of SDC, the time to boil is reduced from approximately 4.0 hours when the water level is 23 feet above the reactor vessel flange to approximately 2.3 hours at 12 feet, when the reactor has only been shutdown for 6 days. However, this is ample time to close containment (less than 1 hour), and to restore SDC or initiate alternative cooling (e.g., add water to the cavity (approximately 1 hour)).

Requiring the reactor to be shutdown for at least 6 days to have only one loop of SDC operable when the reactor cavity level is between 20 feet and 12 feet above the reactor vessel flange ensures that the time to boil is greater than twice the time it would take us to establish containment closure and to commence reactor cavity fill with the required standby equipment.

One loop of SDC operating with a containment spray pump allows for the high capacity LPSI pump to be the main standby pump capable of filling the reactor cavity to at least 20 feet above the reactor pressure vessel flange in the event SDC is lost. The high pressure safety injection pump will also be maintained OPERABLE to increase the water level if needed. In support of this contingency the RWST will be required to contain the volume of water needed to raised the level to 20 feet above the reactor pressure vessel flange. As discussed above, the reactor cavity can be filled at a rate of approximately 4.0 inches per minute with the LPSI pump.

If operating one loop of the SDC system with less than 20 feet of water above the reactor vessel flange and any of the required conditions are not met, requiring immediate action to establish greater than or equal to 20 feet of water above the reactor vessel flange ensures no time is wasted trying to restore the required condition not met. By taking action to restore the level to 20 feet above the reactor vessel flange the plant will be placed in TS 3.9.4, which only requires one loop of SDC to be operable. Additionally, the core will not heat up while the reactor cavity water level is being raised with cool water from the RWST. This will provide additional time to either restore the one loop of SDC or take other actions to provide core cooling as required by TS 3.9.4.

A PRA showed that operations in accordance with the proposed TS did not significantly increase the probabilities of inventory

boiling and core damage.

5) Item 6 adds wording to the notes in LCOs 3.9.4 and 3.9.5 that was unintentionally deleted by the Unit 2 Amendment No. 127 and Unit 3 Amendment No. 116.

This is an editorial change.

Therefore, operation of the facility in accordance with proposed changes 1 through 5 do not involve a significant reduction in a margin of safety.

Safety and Significant Hazards Determination

Based on the above Safety Analysis, it is concluded that: (1) the proposed change does not constitute a significant hazards consideration as defined by 10 CFR 50.92; and (2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed change. Moreover, because this action does not involve a significant hazards consideration, it will also not result in a condition which significantly alters the impact of the Station on the environment as described in the NRC Final Environmental Statement.

ATTACHMENT "A"

EXISTING SPECIFICATIONS
UNIT 2