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. 125

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL., pursuant to 10 CFR 50.90, hereby submit Amendment Application No. 125.

This amendment application consists of Proposed Change Number NPF-15-402 to Facility Operating License No. NPF-15. Proposed Change Number NPF-15-402 is a request to change Technical Specification (TS) 3.9.8.1 "Shutdown Cooling and Coolant Circulation -- High Water Level" and TS 3.9.8.2 "Shutdown Cooling and Coolant Circulation -- Low Water Level." Proposed Change Number NPF-15-402 requests approval to 1) reduce the water level where two trains of shutdown cooling (SDC) are required from 23 feet to 20 feet above the reactor pressure vessel flange, 2) increase the time a required train 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, 3) allow the SDC system to be removed from service to allow testing of Low Pressure Safety Injection system components, 4) allow for running 1 train 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, and 5) make some editorial changes.

Subscribed on this 28th day of July, 1994.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

By: Richard M Rosenblum

Richard M. Rosenblum

Vice President

State of California

County of Orange

On 7/28/94 before me, Mariane Sanchez,

personally appeared Richard M. Rosenblum, 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

OFFICIAL SEAL
MARIANE SANCHEZ
Notary Public-California
ORANGE COUNTY
My Commission Expires
October 14, 1994

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. 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-10-402 to Facility Operating License No. NPF-10. Proposed Change Number NPF-10-402 is a request to change Technical Specification (TS) 3.9.8.1 "Shutdown Cooling and Coolant Circulation -- High Water Level" and TS 3.9.8.2 "Shutdown Cooling and Coolant Circulation -- Low Water Level." Proposed Change Number NPF-10-402 requests approval to 1) reduce the water level where two trains of shutdown cooling (SDC) are required from 23 feet to 20 feet above the reactor pressure vessel flange, 2) increase the time a required train 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, 3) allow the SDC system to be removed from service to allow testing of Low Pressure Safety Injection system components, 4) allow for running 1 train 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, and 5) make some editorial changes.

Subscribed on this 28th day of July, 1994.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

By: Richard M Rosenblum

Richard M. Rosenblum

Vice President

State of California

County of Orange

On 7/28/94 before me, Mariane Sanchez,

personally appeared Richard M. Rosenblum, 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

OFFICIAL SEAL
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Enclosure 1

DESCRIPTION AND SAFETY ANALYSIS
OF PROPOSED CHANGE NPF-10/15-402

Proposed Change Number 402 (PCN-402) is a request to revise Technical Specification (TS) 3.9.8.1 "Shutdown Cooling and Coolant Circulation -- High Water Level," TS 3.9.8.2 "Shutdown Cooling and Coolant Circulation -- Low Water Level," and the Refueling Operations, Bases: 3/4.9.8 "Shutdown Cooling and Coolant Circulation."

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

This is a request to:

1) reduce the water level where two trains of shutdown cooling (SDC) are required from 23 feet to 20 feet above the reactor pressure vessel flange,

2) increase the time a required train 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,

3) allow the SDC system to be removed from service to allow testing of Low Pressure Safety Injection system components,

4) allow for running 1 train 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,

5) add an action to be taken when op rating 1 train of SDC with less than 20 feet above the reactor pressure vessel flange when the specified requirements are not met,

6) delete the obsolete reference to the implementation of DCP 2-6863 and MMP 3-6863, and

7) delete an obsolete footnote allowing removal of both trains of SDC with the water less than 23 feet above the reactor vessel flange from the Unit 3 TSs.

These changes will allow the required maintenance and testing to be scheduled and performed in a cost effective way saving Southern California Edison (Edison), et al., approximately 48 hours (approximately $800,000) of critical path time in the Cycle 8 refueling outage for each Unit. A similar savings is anticipated for future outages.

The Bases for TS 3.9.8 states that a water level of 23 feet above the flange provides a large heat sink to remove decay heat in the event of a loss of the SDC system, and thus provides time to take other actions. 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. With the reactor cavity flooded to any level above the reactor pressure 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 train of the SDC system operable with the reactor cavity water level greater than or equal to 12 feet above the reactor pressure vessel flange, and b) one train of the SDC system operable with the reactor cavity water level greater than or equal to 20 feet above the reactor pressure vessel flange, to show 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, 2, and 3 provide a permanent solution to a testing requirement originally addressed by a temporary waiver of compliance for Unit 2 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 pressure 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 allow the removal of the required train of SDC from service. These changes permit the required testing to be performed without having to offload 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 train 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.

Also, by lowering the required water level from 23 feet to 20 feet above the reactor pressure vessel flange, maintenance on one SDC train 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 4 and 5 will support additional flexibility in scheduling maintenance outages for the SDC trains and their supporting systems. To support the PRA for having 1 train of SDC operable when the water is less than 20 feet above the reactor vessel flange and greater than 12 feet above the reactor vessel flange, Edison has established 8 requirements to be met and added a new action statement.

Item 6 deletes a statement referring to the implementation of a design change which has been implemented in both Units 2 and 3. Item 7 deletes a footnote that was applicable only during initial fuel loading. This footnote was added by Amendment 1 to NFP-15 on January 14, 1983 to support the initial fuel load. Items 6 and 7 are editorial changes and have no impact on plant operation.

DESCRIPTION of CHANGE

PROPOSED TECHNICAL SPECIFICATION CHANGES

The proposed change to the TS 3.9.8.1 Applicability statement, Action statement, and to the Footnotes (#) and (*) for both the Unit 2 and Unit 3 TSs, follows:

> "APPLICABILITY: MODE 6 when the water level above the top of the reactor pressure vessel flange is greater than or equal to ~~23~~ 20 feet.
>
> ACTION:
>
> With no shutdown cooling train OPERABLE and in operation, suspend all operations involving an increase in the reactor decay heat load or a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required shutdown cooling train to OPERABLE and operating status as soon as possible. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.
>
> "The shutdown cooling train may be removed from operation for up to ~~1~~ 2 hours per 8-hour period during the performance of 1) CORE ALTERATIONS in the vicinity of the reactor pressure vessel hot legs or 2) testing of LPSI system components required by the inservice inspection program provided:
>
> 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.

*A containment spray pump may be used in place of a low pressure safety injection pump in either or both shutdown cooling trains to provide shutdown cooling flow. ~~(Subsequent to implementation of DCP 2-6863)~~

The proposed change to TS 3.9.8.2 will revise the Applicability statement, the Limiting Condition for Operation, and the Action Statement as follows and delete Footnote (#) in the Unit 3 TS:

LIMITING CONDITION FOR OPERATION

3.9.8.2 Two independent shutdown cooling trains shall be OPERABLE and at least one shutdown cooling train shall be in operation.*

or

One train 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 greater than 12 feet.

3) One train of Salt Water Cooling (SWC) is OPERABLE and operating.

4) One train of Component Cooling Water (CCW) and the CCW swing pump are OPERABLE, and the CCW train is operating with either of the OPERABLE CCW pumps.

5) One train of Shutdown Cooling is OPERABLE with a containment spray pump operating on shutdown cooling, the high pressure safety injection pump and the low pressure safety injection pump of the same train are OPERABLE and 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 pressure vessel flange is less than ~~23~~ 20 feet.

ACTION:

a. With less than the required shutdown cooling trains OPERABLE, immediately initiate corrective action to return the required shutdown cooling trains to OPERABLE status, or to establish greater than or equal to ~~23~~ 20 feet of water above the reactor pressure vessel flange as soon as possible.

b. If operating one train of the shutdown cooling system with less than 20 feet of water above the reactor pressure vessel flange and any of the required conditions (1 through 8) are not met, immediately take action to establish greater than or equal to 20 feet of water above the reactor pressure vessel flange.

~~b~~ c. With no shutdown cooling train in operation, suspend all operations involving a reduction in boron concentration of the Reactor Coolant System and immediately initiate corrective action to return the required shutdown cooling train to operation. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.

*A containment spray pump may be used in place of a low pressure safety injection pump in either or both shutdown cooling trains to provide shutdown cooling flow. ~~(Subsequent to implementation of DCP 2 6863)~~

Delete Footnote (#) from the Unit 3 Technical Specification.

The Bases for 3/4.9.8 is also being revised as follows:

The requirement to have two shutdown cooling trains OPERABLE when there is less than ~~23~~ 20 feet of water above the reactor pressure vessel flange, ensures that a single failure of the operating shutdown cooling loop will not result in a complete loss of decay heat removal capacity. With the reactor vessel head removed and ~~23~~ 20 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling, thus in the event of a failure of the operating shutdown cooling train, adequate time is provided to initiate emergency procedures to cool the core.

With the reactor vessel head removed and 12 feet of water above the reactor pressure vessel flange and all the specified requirements met, a heat sink is available for core cooling and a method is available to restore the reactor cavity level to 20 feet above the reactor vessel flange. Therefore, in the event of a failure of the operating shutdown cooling train, adequate time is provided to initiate emergency procedures to cool the core.

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 two High Pressure Safety Injection (HPSI) pumps, two Low Pressure Safety Injection (LPSI) pumps, and two Containment Spray (CS) pumps. These pumps are arranged in two redundant and independent trains. A third swing HPSI pump can be aligned to either train.

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 trains to provide shutdown cooling flow.

The following are plant Elevations related to reactor cavity water level above the active fuel:

	Elevation	Height above the Active Fuel
Top of the fuel assemblies	26′ 5-1/8"	1′ 8"
Reactor vessel flange	37′ 6"	12′ 8-7/8"
12′ above the reactor vessel flange	49′ 6"	24′ 8-7/8"
Current TS water level of 23′ above the reactor vessel flange	60′ 6"	35′ 8-7/8"

BACKGROUND

Limiting Conditions for Operation (LCO) in TSs 3.9.8.1 and 3.9.8.2 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 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.

In the Bases Section 3/4.9.8, it is stated that "With the reactor vessel head removed and 23 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling, thus in the event of a failure of the

operating shutdown cooling train, 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 pressure 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 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 us to cross tie the SDC system 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 14 hours of outage time, a savings of approximately $230,000 in Cycle 8. The additional change requiring only 1 train of SDC operable with greater than 12 feet above the reactor pressure vessel flange will save another 34 hours of outage time, which equates to approximately $570,000 in Cycle 8. Total savings associated with PCN-402 is approximately 48 hours (approximately $800,000) of critical path time in the Cycle 8 refueling outage at each unit. Similar savings in future outages are anticipated.

A PRA was performed for the case of operating with only one train of SDC OPERABLE with the water level less than 20 feet and greater than 12 feet above the vessel flange. 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.

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 the safest 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, 2, and 3

The request to lower the required water level from 23 feet above the reactor pressure vessel flange to 20 feet above the reactor pressure 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. This change allows the SDC cooling 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 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 to be performed without unnecessary urgency.

The reduction in the required water level from 23 feet to 20 feet above the reactor pressure vessel flange will also allow one train of SDC and the supporting trains of CCW and SWC to be removed from service and still allow some reactor internals removal preparations to be performed. Currently, the train 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 pressure vessel flange.

The reduction of water from 23 feet above the reactor pressure vessel flange to 20 feet above the reactor pressure vessel flange is a small change and has little impact on the time to boil (3.7 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 train of SDC is still maintained.

To assure the objectives of TS 3.9.8.1 are satisfied during performance of the testing of LPSI system components the following requirements will be met:

1) the periods in which a SDC train is not in operation will be limited to ≤ 2 hours per 8-hour period,

2) The maximum RCS temperature will be maintained ≤ 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 pressure 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

train 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 train 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 TS 4.9.8.1 and TS 4.9.8.2 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 pressure 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, 6 days following shutdown, with 20 feet of water above the reactor pressure vessel flange is approximately 3.5 hours. The time to uncover the core is approximately 77.5 hours.

The reactor cavity water level is maintained greater than or equal to 20 feet above the reactor pressure 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 4 and 5

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. With the reactor cavity flooded to any level above the reactor pressure 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.

Additionally, the cavity water level can be raised approximately 4.0 inches per minute using a LPSI pump. To raise the level approximately 4.0 inches per minute the LPSI pump will provide twice the required SDC flow of 2200 gpm of cold RWST injection water to cool the core while filling the reactor cavity. This will take approximately 30 minutes to align a LPSI pump to fill the cavity and approximately 25 minutes to raise the reactor cavity level to 20 feet above the reactor vessel flange.

The allowance to operate with only one train of SDC OPERABLE and operating with the reactor cavity water level less than 20 feet above the reactor pressure vessel flange but greater than 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 3.9.8.1. 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 us to establish containment closure, and significantly more time than it would take to commence reactor cavity fill with the required standby equipment. Limiting 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 pressure vessel flange to greater than 12 feet 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 train outages running concurrent with reactor internals disassembly and reassembly) we need a water level less than 12'9" above the reactor pressure vessel flange. Typically, we will maintain a level closer to the 12'9" than the 12' above the flange. Twelve feet of water above the reactor vessel flange corresponds to 24' 8-7/8" above the active fuel.

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

4. Require the one train of Shutdown Cooling to operate with a containment spray pump to allow the high capacity LPSI pump to be the main standby pump ready to fill the cavity to at least 20 feet above the reactor pressure vessel flange following any loss of components in the operating SDC train. In the event that CCW is lost, cooling flow to all ECCS pumps is also lost. Maintaining the LPSI pump as backup for emergency filling of the reactor cavity ensures the cavity can be filled within the operating limits of the LPSI pump motor without CCW cooling flow. (the LPSI pump can operate for 30 minutes without CCW flow.) The high

pressure safety injection pump will also be maintained 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. As discussed above, the reactor cavity can be filled at a rate of approximately 4.0 inches per minute using the LPSI pump.

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 train of the shutdown cooling system is operable with less than 20 feet of water above the reactor pressure 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 pressure vessel flange. By taking action to restore the level to 20 feet above the reactor pressure vessel flange the plant will be placed in TS 3.9.8.1, which only requires one train 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 train of SDC or take other actions to provide core cooling.

Proposed Changes: Items 6 and 7

TS 3.9.10 "Water Level - Reactor Vessel" requires the reactor cavity water level to be at least 23 feet above the top of the reactor pressure vessel flange during the movement of fuel assemblies and control element assemblies within the reactor pressure vessel when either the fuel assemblies are being moved or the fuel assemblies seated within the reactor vessel are irradiated fuel assemblies. Therefore, the footnote (#) in TS 3.9.8.2 was only applicable to the initial core load. This footnote was added to the Unit 3 TS 3.9.8.2 to facilitate initial fuel load by Amendment 1 to NFP-15 on January 14, 1983. This footnote was appropriate then because no decay heat was present. However, this footnote is not appropriate following operation. The submittal of PCN 299, the Technical Specification Improvement Program, also removed this note. This is only an editorial change and has no impact on operation.

The notes referring to DCP 2-6863 and MMP 3-6863 were added because the TSs were issued prior to the completion of the design change. Therefore, a clarification was needed that the note only applied following the completion of the work. The design change has been completed for both Units 2 and 3, therefore, the notes always apply and the references to DCP/MMP 2(3)-6863 are no longer needed. This is only an editorial change and has no impact on operation.

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) 3.9.8.1 and 3.9.8.2 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 basis 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 trains of SDC are required from 23 feet to 20 feet above the reactor pressure vessel flange,

   In the Bases Section 3/4.9.8, it is stated that "With the reactor vessel head removed and 23 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling, thus in the event of a failure of the operating shutdown cooling train, 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 a minimal 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 train 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,

3) allow the SDC system to be removed from service to allow testing of Low Pressure Safety Injection system components.

The proposed TS changes the time the SDC train 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 train 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 restrictions are discussed separately below.

When securing the only operating train of the SDC system, the maximum Reactor Coolant System (RCS) temperature is maintained ≤ 140°F. The initial conditions and heatup rate are selected such that the RCS temperature remains ≤ 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 available inventory providing the heat sink by several inches. The two hours is sufficient time to align the system to test, perform the test, and restore the train 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 TS 4.9.8.1 and TS 4.9.8.2 is sufficient to ensure complete mixing of the boron within the RCS.

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

4) allow for running 1 train 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,

5) add an action to be taken when operating 1 train of SDC with less than 20 feet above the reactor pressure 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 3.7 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)). Twelve feet of water above the reactor vessel flange corresponds to 24' 8-7/8" above the active fuel.

Requiring the reactor to be shutdown for at least 6 days to have only one train of SDC operable when the reactor cavity level is between 20 feet and 12 feet above the reactor pressure 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 train 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 upon loss of SDC. The high pressure safety injection pump will also be maintained 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. 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 train of the SDC system with less than 20 feet of water above the reactor pressure 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 pressure vessel flange ensures no time is wasted trying to restore conditions that should be used to increase the volume of water of the heat sink. By taking action to restore the level to 20 feet above the reactor pressure vessel flange the plant will be placed in TS 3.9.8.1, which only requires one train 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 train of SDC or take other actions to provide core cooling.

A Probabilistic Risk Assessment (PRA), with a) one train of the SDC system operable with the reactor cavity water level greater than or equal to 12 feet above the reactor pressure vessel flange, and b) one train of the SDC system operable with the reactor cavity water level greater than or equal to 20 feet above the reactor pressure vessel flange, showed that the operations in accordance with the proposed TS would not significantly increase the probabilities of inventory boiling and core damage.

6) delete the obsolete reference to the implementation of DCP 2-6863 and MMP 3-6863.

This is an editorial change.

7) delete an obsolete footnote allowing removal of both trains of SDC with the water less than 23 feet above the reactor vessel flange from the Unit 3 TSs.

This is an editorial change.

Therefore, proposed changes 1 through 7 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 trains of SDC are required from 23 feet to 20 feet above the reactor pressure vessel flange,

2) increase the time a required train 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,

3) allow the SDC system to be removed from service to allow testing of Low Pressure Safety Injection system components,

4) allow for running 1 train 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,

5) add an action to be taken when operating 1 train of SDC with less than 20 feet above the reactor pressure vessel flange when the specified requirements are not met,

The Limiting Conditions for Operation (LCO) in Technical Specifications (TSs) 3.9.8.1 and 3.9.8.2 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 basis 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.

6) delete the obsolete reference to the implementation of DCP 2-6863 and MMP 3-6863, and

This is an editorial change.

7) delete an obsolete footnote allowing removal of both trains of SDC with the water less than 23 feet above the reactor vessel flange from the Unit 3 TSs.

This is an editorial change.

Therefore, the operation of the facility in accordance with proposed changes 1 through 7 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 3.9.8.1 and 3.9.8.2 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 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.

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

In the Bases Section 3/4.9.8, it is stated that "With the reactor vessel head removed and 23 feet of water above the reactor pressure vessel flange, a large heat sink is available for core cooling, thus in the event of a failure of the operating shutdown cooling train, 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 train 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,

3) allow the SDC system to be removed from service to allow testing of Low Pressure Safety Injection system components.

The proposed TS changes the time the SDC train 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 train 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.

When securing the only operating train of the SDC system, the maximum RCS temperature is maintained ≤ 140°F. The initial conditions and heatup rate are selected such that RCS temperature remains ≤ 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 RWST and will increase the available inventory providing the heat sink by several inches. The two hours is sufficient time to align the system to test, perform the test, and restore the

train 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.

The LPSI component testing is only allowed when the reactor cavity water level is maintained greater than or equal to 20 feet above the reactor pressure 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.

4) allow for running 1 train 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,

5) add an action to be taken when operating 1 train of SDC with less than 20 feet above the reactor pressure 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 3.7 hours at 23 feet 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 train of SDC operable when the reactor cavity level is between 20 feet and 12 feet above the reactor pressure 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 train 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 upon loss of SDC. The high pressure safety injection pump will also be maintained 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. The reactor cavity can be filled at a rate of approximately 4.0 inches per minute with the LPSI pump.

If operating one train of the SDC system with less than 20 feet of water above the reactor pressure 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 pressure vessel flange ensures no time is wasted trying to restore conditions that should be used to increase the volume of water of the heat sink. By taking action to restore the level to 20 feet above the reactor pressure vessel flange the plant will be placed in TS 3.9.8.1, which only requires one train 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 train of SDC or take other actions to provide core cooling.

A PRA showed that the operations in accordance with the proposed TS did not significantly increase the probabilities of inventory boiling and core damage.

6) delete the obsolete reference to the implementation of DCP 2-6863 and MMP 3-6863.

This is an editorial change.

7) delete an obsolete footnote allowing removal of both trains of SDC with the water less than 23 feet above the reactor vessel flange from the Unit 3 TSs.

This is an editorial change.

Therefore, operation of the facility in accordance with proposed changes 1 through 7 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.