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 151.

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10 CFR 50.90, hereby submit Amendment Application No 151.

This amendment application consists of Proposed Technical Specification Change No. 479 to Facility Operating License NPF-15. Proposed Technical Specification Change No. 479 is a request to revise TS SR 3.1.5.4, "CEA Alignment."

The proposed change defers implementation of SR 3.1.5.4 until the Unit 3, Cycle 9 refueling outage.

Subscribed on this 7th day of February, 1997.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

By: Dwight E. Nunn

Dwight E. Nunn

Vice President

State of California
County of San Diego
On 2/7/97 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

DESICRIPTION AND SAFETY ANALYSIS OF PROPOSED CHANGE 479

This is a request for an exigent Technical Specification (TS) change to revise Surveillance Requirement (SR) 3.1.5.4 of TS 3.1.5, "CEA Alignment," for SONGS Unit 3.

Existing SONGS Specifications:

Unit 3: See Attachment "A"

Proposed SONGS Specifications:

Unit 3: See Attachment "B"

Description of Changes

Summary

The proposed change is requested to defer implementation of Surveillance Requirement (SR) 3.1.5.4 of Technical Specification (TS) 3.1.5, "CEA Alignment" until the Unit 3, Cycle 9 refueling outage. In the event of a planned or unplanned shutdown of Unit 3, prior to the Cycle 9 refueling outage, testing in accordance with SR 3.1.5.4 will be performed prior to return to Mode 2.

Discussion

On February 4, 1997, Edison recognized that the existing Unit 3 surveillances of record did not fully satisfy SR 3.1.5.4. The SR requires that a channel functional test be performed on each Reed Switch Position Transmitter (RSPT). This test will require that each RSPT be exercised over the measurement range and the output of each RSPT be monitored over the full range of Control Element Assembly (CEA) travel to ensure that the output is continuous. It is not possible to perform this functional test with the Unit in Mode 1. The circumstances surrounding the situation are detailed in a letter from, R. W. Krieger to William H. Bateman, dated February 6, 1997.

After reviewing existing documentation, however, Edison believes that the CEA position indication is fully functional and capable of performing its intended safety functions, as demonstrated by inherent reliability of the reactor protection system design, the RSPT component design, and operating history at the unit. In fact, existing testing demonstrates operability of each RSPT.

System Description

The RSPTs are part of the Reactor Protective System (RPS) which includes the CPCs and the CEACs. Four independent CPCs are provided, one in each protection channel. Calculation of Departure from Nucleate Boiling Ratio (DNBR) and local power density is performed in each CPC. The DNBR and local power density so calculated are compared with trip setpoints for initiation of a low DNBR trip and the high local power density trip.

Each CPC receives the following inputs: core inlet and outlet temperature, pressurizer pressure, reactor coolant pump speed, excore nuclear instrumentation flux power, selected CEA position, and CEA subgroup deviation from the CEACs. The RSPTs provide CEA position information to the CEACs and the CPCs. Correction of excore flux power for shape annealing and CEA shadowing, fuel rod and coolant channel planar radial peaking factors based on CEA positions, and CEA group deviation alarm are functions performed in the CPCs or the CEACs.

Two independent CEACs are provided as part of the CPC system to calculate individual CEA deviations from the position of the other CEAs in their subgroup. Each CEA is instrumented by two independent CEA RSPTs. One set of the independent signals for all CEAs is monitored by one CEAC and the other set of signals by the other CEAC.

The CEAs are arranged into control groups that are controlled as subgroups of CEAs. The subgroups are symmetric about the core center. The subgroups are required to move together as a control group and should always indicate the same CEA group position. The CPCs utilize single CEA deviation penalty factors from the CEACs to modify calculational results in a conservative manner should a deviating CEA be detected by either CEAC.

Each CEAC monitors the position of all CEAs within each control subgroup. Should a CEA deviate from its subgroup position by more than 5", the CEACs will sound an annunciator in the Control Room, and, if appropriate, transmit "penalty" factors to the CPCs that will cause trip setpoints to be approached. RSPT inputs to the CEACs are checked for out-of-range values and excessive rate of change values. If the signal is out of range (greater than 155" or less than -5.8"), a sensor failure alarm is generated.

The RSPT consists of a series of magnetical actuated reed switches spaced at intervals along the CEA housing and wired w precision resistors in a voltage divider network. A magnet attached to the CEA extension shaft actuates the adjacent reed switches, causing voltages proportional to position to be

transmitted for each assembly. The two RSPTs are physically and electrically separated from each other and are safety grade instruments.

The only active components within an RSPT are the magnetically actuated reed switches. At each CEA location, due to the length of the magnet, two pairs of reed switches are normally closed with all of the other reed switches normally open. If a single pair of reed switches were to stick in the closed position, the RSPT would not function properly and the failure would be detected by the cross channel calibration during power operation. A single switch failing to close would not normally cause a loss of position indication since another pair would be expected to be closed at each location. To lose position indication at any location would require at least one switch in each of the two adjacent pairs to fail to close. This would result in the loss of the RSPT output signal at the corresponding CEA position. A deviation alarm would be annunciated. This ensures conservative operation of the RPS, as any credible failure of a CEA reed switch assembly will result in an operator alarm.

With the CEA at the fully withdrawn position, the cross channel check provides reasonable assurance that there is no pair of switches that are failed in the closed position below the CEA position. Monitoring of the CEA position during quarterly CEA exercises provides assurance that the reed switches corresponding to the fully withdrawn position are not stuck closed. Failure of two reed switches of adjacent reed switch pairs to close as the CEA is moved by that new location would be annunciated.

Additionally, there is an independent non-safety related CEA position system called the Pulse Counting CEA Position Indication System. The pulse counting CEA position indication system infers each CEA position by maintaining a record of the "raise" and "lower" control pulses sent to each magnetic jack control element drive mechanism (CEDM). This system is incorporated in the plant computer which feeds control board digital displays for a selected group and a selected individual CEA. If an alarm occurs, the operators will use the pulse counting CEA position system in conjunction with the RSPT to evaluate rod position.

Justification of Operability

Surveillance Requirement 3.1.5.4 requires a CHANNEL FUNCTIONAL TEST (CFT) of the RSPT channel. This defined requirement is expanded upon in the bases as ensuring that the channel is operable and capable of indicating CEA position over the entire length of the CEA's travel. Although Edison has not yet developed procedures and criteria for this surveillance, an adequate refueling interval test of the RSPTs would include the following objectives:

A Verification of RSPT output at a known physical CEA position,
B Verification of power supply to the RSPT to ensure proper scale and range,
C Verification of RSPT circuit insulation is adequate to preclude signal degradation,
D Verification of signal processing and display over the range of operation (CEAC), and
E Verification of transmitter response across the entire length of CEA travel.

The following Surveillance Tests are currently performed on at least a refueling interval:

SO23-V-12.2.4 Surveillance Requirement CEAC test and Calibration performs:

Verification of RSPT and display indication with all CEAs at the fully inserted position. This provides independent verification of RSPT output at a reference position. (Objective A)

Verification RSPT circuit insulation resistance >1.1M ohm. This demonstrates that the circuit insulation has not degraded. (Objective C)

Verification at 6 points of signal processing and display by injection of a simulated signal to the CEACs over the range of operation. (Objective D)

SO23-V-12.2.2 CPC Channel Calibration and Functional Test performs:

Verification of power supply to each RSPT. (Objective B)

As evident above, Edison did not previously conduct a surveillance to achieve objective E. However, alarm features of the CEACs, in combination with p ant operation and other surveillances of equivalent or shorter frequency, demonstrate transmitter response across the entire length of CEA travel such that it is concluded that the intent of objective E is met. These features and operations include:

CEA Withdrawal During Reactor Startup:

During reactor startup, CEAs are withdrawn from a fully inserted to the All Rods Out (ARO) condition, which moves each RSPT over the entire length of travel. Both CEACs were operable during the Unit 3 cycle 8 and the recent forced outage reactor startups. Between the two CEACs, every RSPT is monitored. As previously discussed, one of the CEAC functions is to generate a CEA deviation alarm whenever the spread of indicated CEA positions within a CEA subgroup exceeds 5 inches.

In the event an RSPT fault were to occur which is significant to the CEA alignment requirement, the CEAC involved would generate a CEA deviation alarm. The CEAC deviation alarm is based on the position indication of an individual CEA relative to the position indication of other CEAs within its subgroup. For a significant RSPT failure to go undetected, each of the other (typically 3) CEAs in the subgroup would need similar (>5 inch) indication errors. This is not considered credible. If a deviation alarm is generated, operating procedures require confirmation of this deviation against the other RSPT string and pulse counter monitoring the deviant CEA position.

Based on a review of Unit 3 cycle 8 and the recent forced outage startup data, no deviation alarms were attributed to RSPT failures. Additionally, no RSPT sensor failures were recorded during those startups. Therefore, the RSPTs were demonstrated to be operable. Although this is not a documented surveillance test, it strongly supports objective E.

Shiftly Channel Checks:

Operations Shiftly Surveillance procedure SO23-3-3.25, requires a cross check that the Channel-1 RSPT indicates within 5 inches of the Channel-2 RSPT associated with the same CEA. This channel check is performed for all 91 CEAs. These checks are performed at a wide variety of CEA positions during the cycle, but are predominantly clustered around the ARO operating condition.

CEA Drop Time Test (SO23-V-12.2.26):

Prior to reactor startup and in accordance with SR 3.1.5.5, all CEAs are withdrawn and one of the two available CEACs is loaded with test software. This software verifies the CEA drop time. A feature of this software is to generate a data file of the CEA positions every 50 milliseconds during CEA travel. This data is provided to the test engineers for detection of any anomalous indications. Although not specifically designed to meet SR 3.1.5.4 objective E, review of the Unit 3 data derived from the test using CEAC #1 demonstrated that

all channel 1 RSPTs responded smoothly and consistently over the entire range of CEA travel at the points scanned during the CEA drop.

In summary, existing Surveillance test procedures, in combination with routine CEA operations and CEAC deviation alarms are sufficient to demonstrate operability of each RSPT.

Probabilistic Risk Assessment

Probabilistic risk assessment insights indicate that deferral of the tests until the Unit 3 refueling outage would expose the plant to no increase in risk over that of normal plant operations and would avoid the risks associated with shutting the unit down to perform the tests.

Specifically, the core damage and significant radioactive release risk impact of continued Unit 3 operation up to the next outage without performing the subject CEA surveillance test has been determined to be negligible. The San Onofre Units 2/3 living probabilistic risk assessment (PRA) does not include detailed modeling of the control rods and drive mechanisms. Therefore, the potential impact of mis-positioned CEAs cannot be analyzed directly using the PRA. However, the potential mis-positioning of CEAs is not believed capable in design basis or severe accidents of causing more than localized fuel pin failure. There would be no increased threat of a loss of coolable core geometry or a challenge to RCS integrity from localized fuel failure. The impact on core damage risk from a forced unit shutdown to perform the subject surveillance test is estimated to be 1E-6, which is non-negligible. Therefore, the safest course of action is to remain at power and conduct the surveillance testing during the next outage.

This proposed change will preclude the need to shut down Unit 3 before the refueling outage for the sole purpose of performing this SR. The start of the Unit 3 cycle 9 refueling outage is currently anticipated for April 12, 1997.

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 any accident previously evaluated?

Response: No

The proposed change would defer the implementation of Surveillance Requirement (SR) SR 3.1.5.4 of Technical Specification (TS) 3.1.5 until the Unit 3, Cycle 9 refueling outage.

Operation of the facility would remain unchanged as a result of the proposed changes and no assumptions or results of any accident analyses are affected. Based on testing, operating experience, and the inherent reliability of the system, Edison concludes the Reed Switch Position Transmitters have demonstrated their capability to perform their specified safety function and are operable. Therefore, the proposed change will not involve a significant increase in the probability or consequences of any accident previously evaluated.

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 previously evaluated?

Response: No

The proposed change would defer the implementation of Surveillance Requirement (SR) SR 3.1.5.4 of Technical Specification (TS) 3.1.5 until the Unit 3, Cycle 9 refueling outage.

Operation of the facility would remain unchanged as a result of the proposed change. The Reed Switch Position Transmitters can not initiate an accident. Therefore, the proposed change will 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

The proposed change would defer the implementation of Surveillance Requirement (SR) SR 3.1.5.4 of Technical Specification (TS) 3.1.5 until the Unit 3, Cycle 9 refueling outage. The Reed Switch Position Transmitters are concluded to be able to perform their safety function and are operable. Therefore, the proposed change will 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 proposed change 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 3