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. 131

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10 CFR 50.90, hereby submit Amendment Application No. 131.

This amendment application consists of Proposed Technical Specification Change No. NPF-10-420 to Facility Operating License NPF-10. Proposed Technical Specification Change No. NPF-10-420 is a request to change Technical Specification 3.3.3.2, "Instrumentation Incore Detectors." The proposed Technical Specification change will redefine an operable incore detector string and include additional new requirements to ensure the incore detector system remains capable of performing its intended functions. The proposed change remains within the current licensing basis, and is consistent with the Core Operating Limit Supervisory System operating characteristics and safety analysis.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

By: Harold B. Ray
Harold B. Ray
Senior Vice President

State of California
County of Orange

On 3/1/93 before me, Mariane Sanchez,
personally appeared Harold B. Ray, 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

James A. Beoletto
Attorney for Southern
California Edison Company

By: James A. Beoletto
James A. Beoletto

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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. 115

SOUTHERN CALIFORNIA EDISON COMPANY, ET AL. pursuant to 10 CFR 50.90, hereby submit Amendment Application No. 115.

This amendment application consists of Proposed Technical Specification Change No. NPF-15-420 to Facility Operating License NPF-15. Proposed Technical Specification Change No. NPF-15-420 is a request to change Technical Specification 3.3.3.2, "Instrumentation Incore Detectors." The proposed Technical Specification change will redefine an operable incore detector string and include additional new requirements to ensure the incore detector system remains capable of performing its intended functions. The proposed change remains within the current licensing basis, and is consistent with the Core Operating Limit Supervisory System operating characteristics and safety analysis.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

By: Harold B. Ray
Harold B. Ray
Senior Vice President

State of California
County of Orange

On 3/1/93 before me, Mariane Sanchez,
personally appeared Harold B. Ray, 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
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James A. Beoletto
Attorney for Southern
California Edison Company

By: James A. Beoletto
James A. Beoletto

DESCRIPTION AND SAFETY ANALYSIS
OF PROPOSED CHANGE NPF-10/15-420

This is a request to revise Technical Specification (TS) 3.3.3.2, "Instrumentation Incore Detectors."

Existing Specifications

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

Proposed Specifications

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

Description

The proposed change to TS 3.3.3.2 redefines an operable incore detector string (location) such that a string would be considered operable with at least three out of five rhodium detectors operable as opposed to the existing TS requiring a minimum of four out of five detectors operable. To constrain the total number of detector failures allowed, a requirement that at least 75% of all detectors be operable is also included with this change. To further ensure that all parts of the core are instrumented, at least one operable detector in each quadrant at each level will be required. In addition, the proposed change strengthens the provision related to quadrant symmetric locations by explicitly stating at least six tilt estimates are required with at least one tilt estimate at each of three levels. This proposed change allows greater variance in failed detector patterns while remaining within the current licensing basis, and is consistent with existing Technical Specifications at other plants with similar incore detector arrangements.

Background

TS 3.3.3.2 defines the criteria by which the fixed incore detector system is determined to be operable. Under the existing provisions of the specification, incore system operability requires:

> "a. At least 75% of all incore detector locations, and
>
> b. A minimum of two quadrant symmetric incore detector locations per core quadrant.
>
> An OPERABLE incore detector location consists of a fuel assembly containing a fixed detector string with a minimum of four OPERABLE rhodium detectors."

The purposes of the incore instrumentation system are to evaluate core power distribution, perform calibration of the ex-core flux measurement system, and provide inputs to the Core Operating Limit Supervisory System (COLSS).

The incore instrumentation system consists of a maximum of 56 detector strings, each positioned in the center guide tube of selected, unrodded fuel assemblies. Incore detector string A-14 is now used for the Refueling Water Level Probe (RWLP). However, for all purposes listed above, this string is considered inoperable and "56" is still considered the maximum number of potential detector strings. As such, only 55 locations are potentially available for flux monitoring and calibration functions; one less than the assumed maximum compliment of detector locations.

Each string contains five, self-powered rhodium detectors located at different vertical positions and a thermocouple at the coolant exit from the fuel assembly. All strings also contain a background signal not currently used by the on-line system. The plant computer systems [Plant Monitoring System (PMS) and COLSS Backup Computer System (CBCS)] correct all the incore detector signals for background using database constants and changes in sensitivity with burnup.

The incore detector signals are used by the off-line computer code CECOR to calculate the spatial power distribution in the core including azimuthal tilt and power peaking factors. The information is used to calibrate the ex-core detectors at cycle startup and also to confirm the power distribution required by the Technical Specifications. The Core Protection Calculators (CPCs) use the ex-core signals and the calibration information with other plant parameters to calculate the departure from nucleate boiling ratio (DNBR) and the linear heat rate (LHR) values. A reactor trip signal is generated by the CPCs, when necessary, to ensure the specified acceptable fuel design limits on either DNBR or LHR are not exceeded.

The incore detector signals and other plant parameters are used by the COLSS monitoring program to assist the operator in maintaining DNBR, peak linear heat rate, azimuthal tilt, axial shape index, and core power within their specified operating limits during normal operation. In addition, the core power distribution monitoring code CECOR uses the incore detector signals to develop axial and radial power distributions and various peaking factors, one of which (F-XY) is a Technical Specification Section 3.2.2 requirement.

Discussion

The proposed change to TS 3.3.3.2 would place additional requirements on the spatial distribution of operable detectors while redefining an operable detector location. A second modification would alter the requirements related to the quadrant symmetrical locations for incore system operability.

The existing TS 3.3.3.2 requires at least 75% (42) of all detector locations (56) be operable. The proposed change maintains this provision and adds the requirement that at least 75% (210) of all detectors (280) be operable. In addition, at least one operable detector at each of the five levels in each quadrant would be necessary for system operability in order to ensure all parts of the core are instrumented.

The definition of an operable detector location would be modified to necessitate operability of at least three detectors in a string in lieu of four detectors in a string. These changes ensure the necessary number and spatial distribution of operable detectors are available for COLSS and CECOR flux mapping, while allowing for an additional inoperable detector per string.

The existing TS 3.3.3.2 requires a minimum of two quadrant symmetric incore detector locations per core quadrant for system operability. Currently, in order to make an estimate of the azimuthal flux tilt, a minimum of two sets of quadrant symmetric groups of detectors must be operable. In other words, the minimum required is two sets distributed over at least four levels in operable strings (inoperable strings are not considered). Since the two symmetric locations could each contain a failed detector at different levels, the existing specification in effect requires six tilt estimates, but does not require that these tilt estimates be limited to any specific axial region. The proposed specification states the "six tilt estimates" requirement explicitly, and further requires at least one tilt estimate be available at each of three levels to ensure redundancy and a representative core average. Also, the proposed specification would reflect the current COLSS requirement of a minimum of six rings distributed over at least three levels.

The proposed definition of an operable detector location allows for an additional inoperable detector per string. This change, by itself, would allow the number of operable detectors to decrease to 60% (168) of all detectors (280). However, a requirement that at least 75% (210) of all detectors (280) be operable is added to limit the total number of detector failures allowed. The overall proposed change enhances the requirements on detector spatial distribution and tilt estimates by requiring at least one operable detector in each quadrant at each level, and requiring at least six tilt estimates with at least one estimate at each of three levels. The proposed change remains within the current licensing basis, and is consistent with the COLSS operating characteristics and safety analysis.

Safety Analysis

The proposed change described above shall be deemed to involve a significant hazards consideration if there is a positive finding in any 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

   This proposed change redefines an operable incore detector string so that a string is considered operable with up to two failed detectors as opposed to the existing requirement which allows only one failure. To constrain the total number of detector failures

allowed, the requirement that 75% of all the detectors be operable has been added. To further ensure all parts of the core are instrumented, at least one detector is required in each quadrant at each level. In addition, the proposed specification strengthens the provision related to quadrant symmetric locations by explicitly stating at least six tilt estimates are required with at least one tilt estimate at each of three levels. These requirements meet the assumptions or are more conservative than the assumptions used in the applicable safety analyses, uncertainty analyses and design basis documentation related to Core Operating Limit Supervisory System (COLSS) and the Combustion Engineering power distribution synthesis code (called CECOR). Therefore, there is no significant increase in the probability or consequences of an accident previously evaluated.

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

   Response: No

   The incore instrumentation system is used for monitoring azimuthal power tilt, radial peaking factors, local power density, and departure from nucleate boiling ratio (DNBR) margin. This proposed change allows for additional incore detector failures prior to declaring the incore instrumentation inoperable and has no effect on the signals received from the incores by COLSS and CECOR. COLSS and CECOR uncertainties are based on a random failure of 25% of individual detector locations which is consistent with the proposed change. Therefore, this change does not create the possibility of a new or different type 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

   This change modifies the definition of an operable incore detector location to reduce the minimum number of operable rhodium detectors in a location from four to three. This change alone would reduce the minimum total number of detectors to 60%. However, to constrain the total number of detector failures allowed, and maintain the margin of safety required by the safety analysis, uncertainty analysis and other applicable design basis documentation, the requirement that 75% of all detectors be operable is included. To further ensure all parts of the core are

instrumented, at least one detector is required in each quadrant at each level. Therefore, this change does 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; 2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed change; and 3) this action will not result in a condition which significantly alters the impact of the station on the environment as described in the NRC Final Environmental Statement.