BEFORE THE UNITED STATES NUCLEAR REGULATORY COMMISSION

Application of SOUTHERN CALIFORNIA EDISON COMPANY and SAN DIEGO GAS & ELECTRIC COMPANY for a Class 104(b) License to Acquire, Possess, and Use a Utilization Facility as Part of Unit No. 1 of the San Onofre Nuclear Generating Station	)	DOCKET NO. 50-206 Amendment Application NO. 202

SOUTHERN CALIFORNIA EDISON COMPANY and SAN DIEGO GAS & ELECTRIC COMPANY, pursuant to 10 CFR 50.90, hereby submit Amendment Application No. 202.

This amendment application consists of Proposed Change No. 251 to the Unit 1 Operating License No. DPR-13. Proposed Change No. 251 provides an extension to the steam generator inspection schedule contained in the Technical Specifications incorporated in Facility Operating License No. DPR-13 as Appendix A. Technical Specification 4.16.C.1 requires that the inservice inspections of steam generators be performed no later than 24 calendar months after the previous inspection. The proposed change requests a 4-month extension to the interval. This extension will preclude the need for a plant shutdown to perform the inspection in September, 1992.

The proposed change is similar to an October 31, 1989 request by SCE for a 4-month extension to the steam generator inspection interval. This request was approved by the NRC in its Order confirming SCE commitments on Full-Term Operating License open items dated January 2, 1990.

Based on the significant hazards analysis provided in the "Description and Significant Hazards Consideration Analysis" of Proposed Change No. 251, it is concluded that (1) the proposed change does not involve a significant hazards consideration as defined in 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.

Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

By: _____
Harold B. Ray
Senior Vice President

State of California
County of Orange
On April 6, 1992 before me, Linda L. Rulon,
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 Linda L. Rulon

LINDA L. RULON
COMM. #968229
Notary Public-California
ORANGE COUNTY
My comm. expires MAR 04,1996

James A. Beoletto
Attorney for Southern
California Edison Company

By: _____
James A. Beoletto

DESCRIPTION AND SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS
OF PROPOSED CHANGE NO. 251 TO THE TECHNICAL SPECIFICATIONS
FACILITY OPERATING LICENSE NO. DPR-13

This is a request to revise the San Onofre Nuclear Generating Station Unit 1 (SONGS 1) Facility Operating License to allow a 4-month extension to the steam generator inspection interval.

DESCRIPTION

Section C.1 of SONGS 1 Technical Specification 4.16, "Inservice Inspection of Steam Generator Tubing," requires that inservice inspections of the steam generators be performed at a frequency "not less than 10 nor more than 24 calendar months after the previous inspection." The proposed change will provide for a 4-month extension to the inspection interval from 24 to 28 calendar months. This will preclude an unscheduled outage in September 1992. The following sections establish that the 4-month extension to the inspection interval will not result in any significant additional deterioration of the steam generator tubes.

The Technical Specification inservice inspection of steam generator tubing is performed when the plant is in a shutdown condition. The proposed change addresses the scheduling of this inspection. The regular primary-to-secondary leakage monitoring activities during plant operation would continue, unaffected by the proposed change.

DISCUSSION

BACKGROUND

The last scheduled Technical Specification inservice inspection of SONGS 1 steam generators was completed on September 7, 1990, during the Thermal Shield Support Replacement and Cycle 11 Refueling Outage that started on June 30, 1990 (Reference 1). During this outage, a significant amount of work was expended for thermal shield repairs, in addition to the refueling and the steam generator inspection activities. Consequently, although the steam generator inspections were completed in September 1990, the plant was not returned to service until March 1991.

With the maximum interval of 24 calendar months between inspections allowed by Technical Specification 4.16.C.1, the next inspection of the steam generators must be performed no later than September 7, 1992. However, SONGS 1 is scheduled to be permanently shutdown in late 1992. The existing Technical Specification inspection interval would require a shutdown in September 1992 for steam generator inspections, shortly before the scheduled permanent shutdown. An extension of the inspection interval to 28 calendar months will preclude the need to schedule an outage in September 1992.

A limited inspection of the steam generators was also performed in April 1991 following return to service from the Thermal Shield Support Replacement and Cycle 11 Refueling Outage (Reference 2). This inspection was not intended to satisfy any specific Technical Specification surveillance requirements, but to identify and repair primary-to-secondary leakage detected during operation. This leakage was attributed to leakage through sleeve joints. These tubes did not leak during leak testing performed as part of the September 1990 inspection, and typically, eddy current testing is not able to identify leakage through sleeve joints. The scope of the April 1991 eddy current testing was subsequently expanded to include a larger sample of the tubes. Evaluation of the results led to the conclusion that the defects identified during the expanded inspection were not a safety concern.

Based on results of recent inspections, and due to the limited operation of the plant since the last scheduled inspection, SCE has determined that the proposed extension to the inspection interval will not result in any significant additional degradation of the steam generator tubes.

The proposed change is similar to a request made by SCE on October 31, 1989 for a 4-month extension to the steam generator inspection interval (Reference 3). This request was approved by the NRC in its Order confirming SCE commitments on Full-Term Operating License open items dated January 2, 1990.

BASIS FOR INSPECTION INTERVAL EXTENSION

A 4-month extension to the SONGS 1 steam generator inservice inspection interval is justified on the basis that:

1. Results of recent inspections (References 1 and 2) have demonstrated that progression of previously identified degradation mechanisms affecting the steam generator tubing and sleeves is limited. The results do not identify trends for significant additional degradation during the proposed 4-month extension in the inspection interval.

2. Operational experience and the results of recent inspections (References 1 and 2) show that sleeve joint leakage is well within Technical Specification and design limits. Leakage monitoring in accordance with Technical Specification 3.1.4, "Leakage and Leakage Detection Systems," will ensure that leakage will be detected and will not exceed acceptance limits. An enhanced primary-to-secondary leak rate monitoring program described in Reference 2 provides further assurance of this.

3. The potential for tube degradation will remain low due to the reduced temperature program under which SONGS 1 has been operating since 1981. The program involves a reduction of the steam generator inlet temperature by 25°F. The lower temperatures lead to a reduction in tube corrosion rates which in turn results in a reduced probability of tube degradation.

The above bases are supported by the results of recent steam generator inspections and the operational changes implemented at SONGS 1 following the

steam generator sleeving outage in 1980-1981. These inspection results and operational changes are discussed below.

SEPTEMBER 1990 STEAM GENERATOR INSPECTION AND REPAIR

The last scheduled Technical Specification inservice inspection of SONGS 1 steam generator tubing was performed from August 23, 1990 through September 7, 1990 during the Thermal Shield Support Replacement and Cycle 11 Refueling Outage. This outage lasted from June 30, 1990 through March 28, 1991. In addition to refueling and steam generator inspection activities during this outage, a significant amount of work was expended for thermal shield repairs. Consequently, although the steam generator inspections were completed in September 1990, the plant was not returned to service until March 1991.

A total of 3,949 tubes (39.5% of the tubes in service) were inspected and 29 tubes were removed from service by mechanical plugging during this outage. The inspection results, which are documented in Reference 1, demonstrated that the progression of previously identified degradation mechanisms was limited. These mechanisms include secondary side degradation at the cold leg top of the tubesheet, primary side roll transition cracking, and secondary side circumferential degradation at the hot leg top of the tubesheet. There was no detectable progression of denting, antivibration bar (AVB) wear, or sleeve degradation. The sleeve joint leakage during operation and during leak testing was observed to be within Technical Specification and design limits.

APRIL 1991 STEAM GENERATOR INSPECTION AND REPAIR

A limited inspection of the steam generators was performed in April 1991 following return to service from the 1990-91 Thermal Shield Support Replacement and Cycle 11 Refueling Outage. The purpose of this inspection was to identify and repair primary-to-secondary leakage detected during operation following the 1990-91 outage. Seventeen tubes were identified to be leaking, and the leakage was attributable to leaking sleeve joints. These tubes did not leak during leak testing performed as part of the September 1990 inspection, and typically, eddy current testing is not capable of identifying leakage through sleeve joints. The sleeve joint leakage during operation and during leak testing was observed to be within Technical Specification and design limits.

Eddy Current Testing (ECT) was used to verify that the leaking sleeved tubes and the surrounding tubes had no through-wall defects. The ECT identified a defective tube, and the inspection was subsequently expanded to include 140 tubes full length, 860 unsleeved tubes (23.3% of the unsleeved tubes in service), and 100% of the sleeved tubes. A total of 40 tubes were removed from service and plugged as a result of this inspection. The inspection results are documented in Reference 2.

Evaluation of the April 1991 inspection results led to the conclusion that the defects identified by ECT were not a safety concern. Evaluation of the most significant flaws identified (Type A flaws characterized by a small affected area and sharp features), although not conclusive, confirmed that the most likely cause of the flaws was corrosion due to local concentration of

impurities in the sludge pile in the secondary side of the tubes. Further eddy current data evaluation concluded that these flaws were not cracks.

OPERATIONAL CHANGES

Intergranular Attack (IGA) necessitated a major steam generator sleeving in 1980-81. Significant changes in the operation of SONGS 1 were implemented in response to the IGA. These changes served to reduce the rate of IGA progression as well as the rates of other corrosion mechanisms. Specifically, a reduced temperature program was implemented prior to returning the unit to service following the outage. This program reduced the steam generator inlet (hot leg) temperature by 25°F. Based on data presented in an EPRI report (Reference 4), this temperature reduction is estimated to have lowered corrosion rates by 50 to 75 percent, and significantly decreased tubing failure probabilities. Also, as discussed earlier, results of subsequent inspections indicate that the progression of IGA in unsleeved tubing since the sleeving outage has been slow.

Other changes to SONGS 1 during the 1980-81 outage included significant improvements in secondary system water chemistry control. In addition to implementation of the Steam Generator Owners Group (EPRI) Water Chemistry Guidelines (to the extent practicable with phosphate steam generator chemistry), the limits on phosphates were updated to assure maximum benefit from phosphate water chemistry control.

SUMMARY

Results of recent steam generator inspections at SONGS 1 indicate that the proposed extension to the inspection interval will not result in any significant additional degradation of the steam generator tubes. The potential for degradation will remain low due to the reduced temperature program in which SONGS 1 has been operating since 1981. Consequently, the proposed extension of the steam generator inspection interval from 24 to 28 calendar months is justified.

REFERENCES

1. Letter, R. W. Krieger (SCE) to the U. S. Nuclear Regulatory Commission, "Steam Generator Inspections," November 29, 1990.

2. Letter, R. M. Rosenblum (SCE) to the U. S. Nuclear Regulatory Commission, "Steam Generator Inspections," May 17, 1991.

3. Letter, Harold B. Ray (SCE) to the U. S. Nuclear Regulatory Commission, "Amendment Application No. 173," October 31, 1989.

4. EPRI Report NP-5971, "1987 EPRI Workshop on Secondary-Side Intergranular Corrosion Mechanisms Proceedings," September 1988.

SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS

In accordance with 10 CFR 50.91(a)(1), the following analysis is provided to demonstrate that the proposed change does not represent a significant hazards consideration. According to 10 CFR 50.92(c), the proposed change discussed above is 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

   The proposed change will extend the steam generator inservice inspection interval from 24 to 28 calendar months. This is not expected to increase the potential for steam generator tube failure, or the probability of an accident previously evaluated. The results of the latest scheduled inspection (September 1990) show that any progression of identified degradation mechanisms that could reduce the tube wall thickness will be limited during a 28 month inspection interval. Evaluation of the results of the unscheduled inspection (April 1991) concluded that the defects identified were not a safety concern.

   Under the reduced temperature program, SONGS 1 has been operating with a reduced steam generator inlet temperature since 1981. In addition to limiting the unit's power output, the lower temperature has reduced the tube corrosion rates, which in turn has reduced the probability of tube degradation. The effect of the reduced temperature program on tube degradation has been demonstrated by the results of recent inspection.

   For these reasons, an extension to steam generator inspection interval by 4 months will not result in an increased potential for tube failure. The existing design and analysis criteria for plugging will remain valid. The probability of accidents previously evaluated will not be impacted. The consequences of accidents previously evaluated will remain bounded by the existing safety analyses. Therefore, operation of SONGS 1 in accordance with the proposed change does not involve a 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 kind of accident from any accident previously evaluated?

   Response: No

   The potential for steam generator tube failure will not increase due to the proposed extension to the inspection interval, and the tubes will remain within the existing design and analysis criteria for plugging. This is supported by the following: (1) progression of tube degradation mechanisms in the past has been limited; and (2) tube corrosion rates will remain low due to operation on a reduced temperature program.

The proposed 4-month extension to the inspection interval is not expected to result in any significant additional deterioration of the steam generator tubes. The extension will not create the possibility of a new hazard to the integrity of the steam generator tubing. Nor will it create any new inter-relationships with other parts of the steam generator or the reactor coolant system. Consequently, the proposed change is bounded by the existing criteria and safety analyses. Therefore, operation of SONGS 1 in accordance with this proposed change will not create the possibility of a new or different kind of accident from any previously evaluated.

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

   Response: No

   The Technical Specifications allow steam generator operation for up to 24 months between inspections. The proposed change will extend this interval to 28 months. Recent inspection results and industry data show that any tube degradation attributable to a 4 month increase in the interval would be minimal. The operational restriction (reduced temperature program) under which the plant has been operating since 1981 will ensure that the potential for tube degradation will remain low.

   The proposed change will not introduce any changes to the plant design, plant configuration, or the method of plant operation. The margin of safety will not be significantly reduced by extending the inspection interval, and will remain within the existing safety analyses. Therefore, operation of SONGS 1 in accordance with this proposed change will not involve a significant reduction in 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) the proposed change 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.